MAPS FOR AN EMERGING NATION

COMMERCIAL CARTOGRAPHY IN NINETEENTH-CENTURY AMERICA

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An Exhibition at the Library of Congress

LIBRARY OF CONGRESS WASHINGTON 1977

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Exhibition organized by Sandra Shaffer Tinkham and Arthur G. Burton, Exhibits Office.

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Preface

The treaty of peace signed in February 1783 terminated the American War of Independence. The former colonists were free to plan their own future and forge a united nation out of thirteen disparate, newly established states. This responsibility was assumed by the infant Congress and by the legislatures of the several states.

Many of the problems confronting the lawmakers were related to the country's geography. There were, for example, the matters of determining accurate boundaries between states and of constructing a transportation network that would strengthen commercial and political ties. Western lands relinquished to the federal government by the states had to be surveyed and disposed of in an equitable and, if possible, profitable manner. To encourage settlement of those regions, turnpikes and canals had to be planned, surveyed, and constructed. Also, the acquisition of extensive territories, through the Louisiana Purchase and other accessions, invited exploration, mapping, and description.

These and other developments created an urgent demand for accurate and detailed maps. Initially the need was met by private and commercial engineers, cartographers, engravers, and publishers, and later by federal surveyors and mapping agencies. The maps they produced contributed much toward the settlement and expansion of the United States and helped mold the American character.

It was in the nineteenth century that the United States attained maturity and evolved as a nation. The story of that emergence may be reconstructed from the maps, charts, and atlases that were published during that period. Local history is portrayed particularly vividly in the state, county, town, and city maps and atlases that were issued in such profusion following the Civil War.

This exhibit brings together a small segment of the cartographic riches of America's first century from the collections of the Library of Congress. In so doing, it reflects the ingenuity, dedication, and labor of a large number of Americans—from surveyors and draftsmen to engravers, lithographers, printers, illustrators, writers, publishers, and salesmen—whose skills and callings helped contribute to the exciting and eventful development of American cartography.

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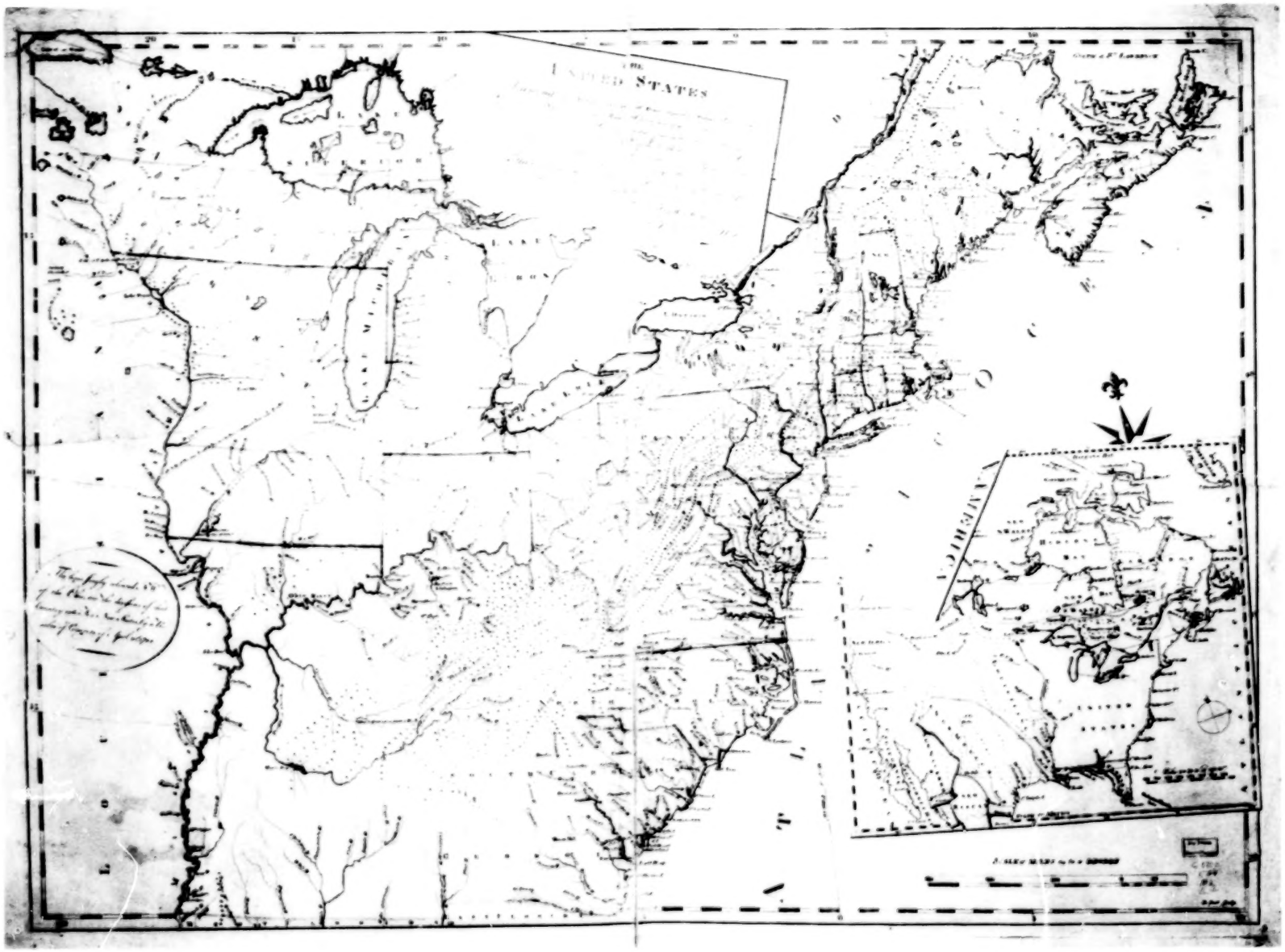


William McMurray. The United States according to the definitive treaty of peace signed at Paris, Septr. 3d. 1783. (Item 2)

Introduction

British America was reasonably well-mapped when the revolutionary war broke out. With some few exceptions, the existing maps had been prepared by English surveyors and cartographers and were engraved and printed in Great Britain. By the peace terms which ended the French and Indian War, England acquired Canada, the Florida peninsula, and that portion of Louisiana lying east of the Mississippi River. Because accurate surveys and maps were virtually nonexistent for these newly acquired lands, Britain's Board of Trade proposed to the king that the North American possessions be divided into a northern and southern district, each headed by a surveyor general of lands. Samuel Holland was named surveyor general for the northern district, and his counterpart in the southern district was William Gerard DeBrahm. Between 1764 and 1770 assistants under both surveyors general prepared surveys and descriptions of their respective areas. Some of the surveys were utilized by English commercial publishers in compiling maps, but most were preserved in manuscript format in British archives. These and other maps prepared by military cartographers proved invaluable to English commanders during the Revolution.

The Continental army was, in contrast, seriously handicapped for want of good maps. To remedy the situation General Washington commissioned Robert Erskine as geographer and surveyor general in July 1777. Simeon DeWitt, who shortly thereafter was named assistant surveyor, succeeded to the geographer position following Erskine's untimely death in October 1780. Some six months later Thomas Hutchins, a native of New Jersey who had served with the British army in America before the Revolution, was named geographer to the southern Continental army. Erskine, DeWitt, Hutchins, and their assistants constituted the first official group of American mapmakers. During and following the war they helped formulate and establish an indigenously American type of cartography. Upon his release from military service in 1784, Simeon DeWitt was appointed surveyor general of New York State, a position he filled with distinction for the next half century. In 1785 the Continental Congress adopted "an ordinance for ascertaining and disposing of lands in the western territory." To implement the act a General Land Office was established with Thomas Hutchins as its geographer. The distributing of public lands was but one of many problems which confronted the young Congress, and was also one for which accurate and up-to-date surveys and maps were essential.

DeWitt recognized the potential utility of the maps prepared during the war under the direction of the surveyors general of the Continental army. He proposed that the Congress publish the maps, both as records of military activities and to provide information for resource planning. In January 1784 DeWitt reported, in a letter to General Washington, that "the remarks on the opposite side (i.e., the Congress) were that the state of our finances was in so low a condition, that the strict economy they were obliged to observe, forbade the application of money to anything but the numerous necessities which urged their immediate relief." Shortly thereafter Simeon DeWitt began his half-century career as surveyor general of New York State. He took with him copies of the military maps which were prepared by him and his associates. Some years later the maps were presented to the New-York Historical Society by DeWitt's son, Richard Varick

DeWitt. They constitute the largest extant collection of revolutionary war maps prepared for Washington's army.

With the Congress and the state governments unable to finance the preparation of maps, private individuals sought to meet this need. Their efforts produced a number of general, state, and regional maps during the half century or so after ratification of the Constitution. Few of these individuals benefited financially from their efforts, but they did establish American private cartography as a viable profession and produce maps which contributed immeasurably to the development and expansion of the young republic. Even before the end of the revolutionary war private American cartographers were borrowing heavily from British mapmakers and publishers. By the end of the eighteenth century, however, U.S. cartographers had achieved considerable independence from British mapmakers and were producing maps and atlases with a distinctive American character.

During the first four or five decades after independence, printing from engraved copperplates continued to be the principal technique for reproducing maps and other graphics. The image had to be incised in reverse on a plate of burnished copper. This required considerable skill and was an exceedingly slow and costly process. Consequently, maps and atlases sold at moderately high prices and were not generally available to lower-income Americans. During these years, therefore, map publishing made little progress; however, toward the end of the fourth decade of the nineteenth century, following the introduction of the lithographic technique to America, cartographic publishing accelerated greatly.

The Engraving Period, ca. 1785-1830

Maps of the United States of America

The need for maps of the new nation was initially met by updating earlier maps and recognizing the United States of America in their titles. Such updated and revised maps were published in Europe as early as 1778. Not until 1784 did Abel Buell, a native of Connecticut, publish his *New and Correct Map of the United States of America.* This large wall map (108 by 123 centimeters), as was reported in the March 31, 1784, issue of the *Connecticut Journal,* was "the effect of the compiler's long and unwearied application, diligence and industry, and as perfection has long been the great object of his labours, and it being the first ever compiled, engraved, and finished by one man, and an American, he flatters himself that every patriotic gentleman, and lover of geographical knowledge, will not hesitate to encourage the improvement of his own country."

In its August 9, 1783, issue, the *Pennsylvania Packet* announced a proposal by William McMurray to publish a map of the United States. Not until late in 1784, however, did subscribers receive copies of McMurray's *The United States According to the Definitive Treaty of Peace Signed at Paris, Septr. 3d 1783.* McMurray is designated "Late Asst. Geogr. to the United States" on the map. One map dated 1780 in the New-York Historical Society's Erskine-DeWitt Collection is credited to McMurray, and he apparently served briefly under surveyor general Erskine or DeWitt.

In 1791 Osgood Carleton, a native of New Hampshire, published at Boston a large map of *The United States of America Laid Down from the Best Authorities Agreeable to the Peace of 1783,* which was engraved by John Norman. Carleton served briefly in the British army before 1760 and there he apparently learned the fundamentals of surveying and mapping. He joined the colonial forces in 1775, participated in the Battle of Bunker Hill and various other campaigns until he was discharged on a disability in December 1778.

The Buell, McMurray, and Carleton-Norman maps were compiled primarily from earlier published works, although McMurray may also have utilized some of the original manuscript surveys prepared under the supervision of Erskine and DeWitt. In 1796 Abraham Bradley, Jr., published a *Map of the United States, Exhibiting the Post-Roads, the Situations, Connections & Distances of the Post Offices . . .,* which was largely based upon new information. Although the map was privately published and copyrighted, Bradley held the office of assistant postmaster general and undoubtedly obtained data for his map from postmasters throughout the country. Bradley's map is one of the first examples of a distinctive American brand of cartography.

Early Road Maps and Guides

Before the Revolution each colony had direct trade relations with Britain which relied upon sea transport. There were few through roads to provide land contact between the several colonies. Maps show-

ing the intercolonial roads were, moreover, virtually nonexistent. As a remedy, several road mapping projects were initiated soon after the revolutionary war ended. The *Columbian Herald* for September 27, 1787, carried a proposal to publish by subscription a "Travelling Map of the Public established high Roads throughout the state of South Carolina from Actual Survey by Walker & Abernethie." Apparently prospective subscribers received a *Specimen of the Intended Travelling Map* which comprised "Plate X. Page 19. Walker & Abernethie, Roads of South Carolina, 1787." The *Specimen* includes three strip maps, positioned side by side on the page, showing the "Road to Watboo Bridge from Charleston by Goose Creek Bridge & Strawberry Ferry." The maps carry a great deal of detail, including the names of individual landowners and the locations of mills and taverns. Thomas Abernethie and Thomas Walker, both natives of Scotland, settled in Charleston, South Carolina, around 1785. Walker, who was an architect and stonecutter, may have prepared the map while Abernethie, who was an engraver and copperplate printer, must have done the engraving and printing. The travelling map of South Carolina was apparently never published for it is known only through two copies of the *Specimen*, one preserved in the South Carolina Historical Society in Charleston and the other in the private collection of a Chicago antiquarian dealer. The travelling map of South Carolina is one of the first of many unrealized projects which litter the arduous course of American private cartography.

Christopher Colles, a native of Ireland who immigrated to America in 1771, published a broadside in 1789 which outlined *Proposals for Publishing a Survey of the Roads of the United States of America*. The title page and three plates of the road book were issued later in the year. Within the next several years 83 page-size maps of a projected 100 were distributed to subscribers. They mapped the major roads between Albany, New York, and Yorktown, Virginia. Colles personally surveyed some of the roads, most probably those in Connecticut, New York, New Jersey, and eastern Pennsylvania. The plates showing roads southward from Philadelphia to Yorktown, however, appear to have been compiled from the military surveys prepared by Erskine, DeWitt, and their assistants. How Colles obtained access to the maps is not known. He was, however, personally acquainted with Generals Henry Knox and John Lamb, who may have served as intermediaries. In 1785 Knox was appointed secretary of war by the Continental Congress and he continued in this office after ratification of the Constitution in 1789. The plates in Colles's *Survey* consist of strip maps arranged two or three to a page as do those in Walker and Abernethie's *Specimen*. They both also include a great deal of detailed information and locate churches, blacksmith shops, mills, taverns, schools and colleges, towns and cities, road junctions, and individual farmsteads. The *Survey* as issued was short of Colles's objectives, and subscriptions were limited in number. There are extant today some fifteen complete copies of the *Survey* (i.e., with eighty-three plates) and an additional ten or fifteen incomplete sets of the plates. It was definitely not a successful financial undertaking for Colles.

State Maps

One of the most pressing cartographic demands following American independence was for maps of the individual states. They were essential for internal administration, to negotiate boundary claims with neighboring states, and for planning and carrying out internal improvement projects. Even before ratification of the Constitution, several states established the positions of chief engineer or surveyor general to undertake surveys and direct such projects. When Simeon DeWitt became surveyor general of New York State in May 1784 there were in the young United States few individuals qualified to fill such posts, and over a period of several decades many states found it neces-

sary to import such specialists from Europe. One of the top priorities of the engineers was to prepare state maps, and this was accomplished within three decades after the new republic was established.

Because few budgets could initially bear the full cost of surveying and mapping programs, the earliest published state maps were produced by enterprising and public-spirited individuals. In most instances, however, they received encouragement and some form of subsidy from state governments. William Blodget, who may have resided in Bennington, Vermont, published a *Topographical Map of the State of Vermont from Actual Survey* in January 1789. It is the first of more than thirty state maps published in one or more editions over the next half century. Blodget's map apparently proved to be popular for a second edition is dated July 1789. Both versions were engraved in New Haven, Connecticut, by Amos Doolittle. Blodget dedicated his map to Gov. Thomas Chittendon, but it is unlikely that he received any financial support from the state. In compiling the map, he seems, however, to have utilized town surveys prepared under the direction of Ira Allen, surveyor general of Vermont from 1779 to 1787.

The success of the Vermont map encouraged Blodget to prepare one of Connecticut, which was published at Middletown, Connecticut, in 1791. The engraver was Joel Allen. A second edition of the map is dated March 1792. Both were dedicated to Gov. Samuel Huntington, but Blodget received minimal support from the state. For compilation data he relied upon contributions solicited from town clerks and other interested persons in a broadside issued in January 1789. This help was acknowledged in the April 14, 1790, issue of the *Connecticut Journal*, which reported that Mr. Blodget's map "will be published as soon as a sufficient number of subscribers will defray the cost," and noted that the compiler had been "assisted by several of the best informed gentlemen in each town, who have furnished him with accurate draughts." The article also stated that Blodget had "obtained from the General Assembly [of Connecticut] an exclusive right to himself of publishing the same."

Other state maps published before 1800 include Reading Howell's Pennsylvania (1792), Dennis Griffith's Maryland (1795), and James Whitelaw's Vermont (1796). All were published in revised editions during the next several decades. Whitelaw served as surveyor general of Vermont from 1787 to 1804 and he benefited from a 1790 resolution of the state legislature which directed "that the selectmen of the several towns in the state make out and send to the surveyor general before the first day of August next a proper plan of their several towns exhibiting the courses and lengths of their lines and what towns they are bounded on. . . . and where towns are not organized it is hereby declared to be the duty of the proprietors' clerks or other persons who may have plans of said towns to forward copies of them in manner aforesaid." Whitelaw's map, therefore, might be considered as an official publication.

Osgood Carleton proposed in 1791 that a map of Massachusetts be published by subscription. With urging from the Massachusetts Historical Society, the legislature of Massachusetts was moved to pass a resolution on June 18, 1794, directing the "Inhabitants of the several towns etc., therein, to take or cause to be taken by their Selectmen or some other Suitable person or persons, appointed for the purpose, accurate plans of their respective towns etc. . . . within seven years not preceding the time of passing said Resolution, and the same plans to lodge in the Secretary's Office on or before the first day of June, A.D. 1795." The directive also applied to the District of Maine, which until 1820 was an administrative unit of Massachusetts. The resolution, which was the strongest yet adopted, produced some 265 maps of Massachusetts towns and 100 of towns in Maine. With further pressure on the legislature by the Massachusetts Historical Society, compilation of the map was entrusted to Osgood Carleton. The finished maps of Massachusetts and Maine were engraved by John Norman. The legislature found the engravings unacceptable and J. Callendar and S. Hill reengraved the plates. The revised

Massachusetts map was published in 1801 and that of the District of Maine in 1802.

The procedures and practices that evolved before 1800 were employed with various refinements and modifications to produce a succession of state maps, a number of which were published in several editions. Some, such as DeWitt's New York State (1802), Carrigain's New Hampshire (1816), Melish's Pennsylvania (1822), Wilson's South Carolina (1822), and Boye's Virginia (1827), were official or semiofficial compilations and/or publications. Many of the remainder, e.g., Bishop James Madison's map of Virginia (1807), received their principal support from private individuals or benefited from varying degrees of official aid or subsidy. Few private compilers had professional training in engineering or cartography. Engraving and printing of state maps were performed in commercial plants.

"From an actual survey," or some variant phrase, is included in the title inscriptions of most state maps. Crude through they were, the surveys represented a distinct improvement over cartographic practices of the colonial period. Surveying was a basic and honored profession in early America, and virtually every town and county had its official surveyor who determined areas and boundaries of private and public land holdings. The instruments of the surveyor included a compass, a chain, a plane table, and sometimes an odometer or perambulator. The latter consisted of a large wheel with a mechanical device which recorded the number of revolutions, hence the distance, as the device was pushed along a selected course or road. The manuscript plats or maps on which the data were recorded were filed in county, district, town, or city archives. They were a prime source of compilation information for the earliest state maps although, as noted, additional data were derived from voluntary solicitation or in response to laws or resolutions. It often proved difficult to join the surveys of two or more adjacent areas, and the compiler was forced to compensate for such inconsistencies. The procedures were refined and improved with each new compilation, and by the second and third decades of the nineteenth century many of the state maps were of remarkably high quality.

The state maps are among the earliest examples of a truly indigenous cartography, and they abundantly reflect American ingenuity and resourcefulness. Commercial map publishing, which achieved a high level of excellence and productivity during the nineteenth century, was built upon the cartographic foundations established by the state maps and their producers. This indebtedness was acknowledged in 1829 by Henry S. Tanner, one of the foremost map engravers and publishers of his day. In the *Memoir on the Recent Surveys, Observations, and Internal Improvements in the United States . . . Prepared to Accompany his New Map of the United States* (1829), Tanner affirmed that "important accessions to the stock of knowledge on the geography of the United States have recently been made, by the publication of excellent local and State maps."

General and State Atlases

Atlases are among the most comprehensive and convenient cartographic formats and a number of such bound volumes of maps were published in America within a few years after the republic was established. In contrast to the state maps, commercial publishers issued most of the early atlases. There was great activity in atlas publishing during the second and third decades of the nineteenth century in response to a growing demand for maps from merchants, shippers, and mariners, as well as schools.

Mathew Carey, a native of Dublin, settled in Philadelphia in 1784 and founded a printing and publishing firm the following year. One of his firm's first titles was an American edition of Guthrie's *Geography*, a popular English textbook. In 1795 Carey published an *American Atlas* to accompany Guthrie's *Geography*. More than half of the twenty-one maps were prepared by Samuel

Lewis, a Philadelphia draftsman, engraver, and handwriting instructor. Several revisions of the *Atlas* were published during the next decade. Similar in format and size to the Carey *Atlas* was W. Winterbotham's *The American Atlas*, which was published by J. Reid of Philadelphia in 1796. It accompanied Winterbotham's *An Historical, Geographical, Commercial and Philosophical View of the United States*. The sixteen maps in the Winterbotham *Atlas* were engraved by several individuals, among them Benjamin Tanner, Henry's brother.

The first U.S. publisher to specialize in geographical and cartographical works was John Melish, a native of Scotland who settled in the United States in 1810. Early visits to America in 1806 and 1809 and an extended trip west to Ohio in 1810 and 1811 were summarized in his two-volume *Travels in the United States* which was published in Philadelphia in 1812. The volumes were illustrated with eight maps which interested Melish in cartography and launched him on a career as a map publisher. His first exclusively cartographic work was *A Military and Topographical Atlas of the United States*, published by G. Palmer of Philadelphia in 1813. An enlarged edition was published in 1815. Henry S. Tanner engraved six of the eight maps in the first edition and eight of the twelve maps in the second. In contrast with some later wars, the War of 1812 appears to have been only a minor stimulant to mapmaking. Melish's military atlas was one of the few cartographic works produced during this period of conflict which was primarily a naval war. American ship commanders relied principally upon the *Atlantic Neptune* and the *American Pilots*, by John and William Norman, published in Boston in several editions between 1792 and 1803.

John Melish is best remembered for his *Map of the United States With the Contiguous British & Spanish Possessions*, the first edition of which was published in June 1816. It was the first large wall map (ca. 91 by 137 centimeters) that showed the full expanse of the United States from the Atlantic to the Pacific. The map proved so popular that six revisions were published dated 1816. *The Map of the United States* is one of Melish's major publications and a significant milestone in the history of American private mapmaking. The early editions were printed from six copperplates which were engraved by John Vallance and Henry S. Tanner. Because of the many geographical changes in early nineteenth-century America and new explorations and settlements, only 100 copies of the map were printed before plates were revised and corrected. Because of this practice twenty-four variants of Melish's map dating from 1816 to 1823 have been identified. Melish issued a booklet with his map entitled *A Geographical description of the United States*, of which 1816, 1819, and 1826 editions were published. In the *Description* the cartographer notes that data used in compiling the map for the more settled areas of the country were derived from "the various state maps, from actual survey."

Since John Melish was one of the most ardent proponents for producing a map of Pennsylvania, he lobbied on its behalf. The act which was passed in 1816 provided for surveys to be carried out in each county. A surveyors' guide was prepared by Melish, and the contract to compile and engrave the map was awarded to him. The *Map of Pennsylvania* published in 1822, is a model of its type. Melish believed that state maps should be officially financed and published. He emphasized that they "should be state property, subject to the control of no individual whatever. Individuals are not equal to the task of bringing them forward, and keeping them correct. Whenever they have embarked in the business, they have lost much time and money; and unless the states embark in it, the geography of the country cannot be brought to maturity."

Melish also produced a number of other maps, including engravings of some Pennsylvania county maps prepared for the state map and a large *Map of the World on the Mercator's Projection* which, along with an accompanying *Geographical Description of the World*, was published in 1818. To complement his wall maps Melish planned to publish a series of small sheet maps of

the states "uniform in plan and size, so that the possessors may bind them, or any number of them into an Atlas." Regrettably, Melish completed uniform scale maps of only eight states before his death in 1822 at the early age of fifty-one.

Henry S. Tanner, also of Philadelphia, succeeded Melish as America's leading cartographical publisher. Tanner and his brother Benjamin were trained as engravers and both had prepared engravings for Melish maps. Henry Tanner, however, expanded his activities to also include compilation, engraving, printing, and publishing. During several decades of operation, the Tanner firm published many maps and atlases and continued to prepare engravings for other publishers. Most noteworthy of Tanner's works is the *New American Atlas*, which was published in its complete format in 1823. Two parts of the *Atlas* appeared in 1819 under the imprint of Tanner, Vallance, Kearny, and Company. Part 3, published in 1821, carried a note reporting that Henry Tanner was now the sole proprietor of the *Atlas*. The final two sections were published as part of the complete volume in 1823. The *New American Atlas* includes twenty-two maps—eleven of individual states or groups of states, and eleven of the world and the several continents. In the introductory *Memoir*, Tanner stated: "The end proposed to be effected by the American Atlas was to exhibit to the citizens of the United States a complete geographical view of their own country, disencumbered of that minute detail on the geography of the eastern hemisphere, which is usually introduced in our Atlases, to the exclusion of matter more immediately interesting to those for whom they are intended." The *Memoir* is also a comprehensive inventory of American cartography in the second decade of the nineteenth century. Revised editions of the *New American Atlas* were published in 1825 and 1835. In 1829 Tanner published a map of the United States at the scale of 1:2,000,000, as well as a large map of North America.

In the early decades of the nineteenth century most commercial cartographical publishers were located in Philadelphia. One notable exception was Fielding Lucas, Jr., who operated a map printing, publishing, and sales establishment in Baltimore from around 1810 to 1854. One of his most distinctive works is the *General Atlas of the World*, published in 1823. Notwithstanding the title, it includes a number of state maps. Lucas published seven atlases and contributed maps for atlases and books issued by other publishers. He published no atlases after 1830, concentrating for the next twenty years on producing sheet maps. Another American atlas publisher of the early 1800s was Anthony Finley whose *New General Atlas* was published in Philadelphia in 1829, 1830, and 1831 editions.

Three state atlases were also published in the third decade of the century. The earliest, Robert Mills's *Atlas of South Carolina*, was issued in 1825. Mills, who is best remembered for his architectural contributions to the cities of Washington, Baltimore, Charleston, and Columbia, South Carolina, served from 1820 to 1830 on South Carolina's Board of Public Works. Here he became familiar with the manuscript surveys of South Carolina's judicial districts which were used by John Wilson in compiling the 1822 official map of South Carolina. Mills proposed that the state publish the district maps separately and as an atlas. Receiving no official support for the proposal, he personally redrafted and updated the district maps and had them engraved by Henry S. Tanner in Philadelphia. In lieu of a title page, Mills used a general map of the state bordered by statistical and descriptive data and bearing the title *Atlas of the State of South Carolina* at the top of the plate. This plate was engraved by B. T. Welch and published for Mills by Fielding Lucas, Jr. An 1838 edition of Mills's *Atlas* is quite rare, indicating that publication was limited. Facsimile editions of the 1825 *Atlas* were published in 1938 and 1965. Mills's *Atlas of South Carolina* is distinctive in being the first of a single state and the only atlas ever published of South Carolina.

David H. Burr's *Atlas of the State of New York*, dated 1829, is second in priority among state atlases. It was

based on official surveys prepared under the direction of surveyor general Simeon DeWitt for an official map of New York State also dated 1829, but which, like the *Atlas*, did not appear until 1830. Although employed by the state, Burr apparently published the *Atlas* as a private effort. A revised edition was published in 1838. Six revisions of the state map were published to 1840. Following a brief period as a commercial publisher, in 1832 David Burr was appointed topographer to the U.S. Post Office Department and geographer to the House of Representatives, positions he held until 1846. He subsequently served in federal surveying posts in Florida, Louisiana, and Utah.

Moses Greenleaf compiled, "from the latest and best authorities," a *Map of the District of Maine*, which was published at Boston in 1815 by Cummings and Hilliard. A revised edition was issued in 1818 and the map was reissued in 1829 as *Map of the State of Maine With the Province of New Brunswick*, with accompanying atlas and statistical volume. Engraving was done by J. H. Young and F. Dankworth of Philadelphia. It was published by Shirley and Hyde in Portland, Maine. Greenleaf's *Maine* is third in priority among state atlases.

American Globes

Like atlases, globes are important teaching tools and are also useful to merchants and traders. Before 1810 virtually all globes used in America were made in Europe, mainly in Great Britain. Around 1798 James Wilson, a Vermont farmer and blacksmith, became interested in constructing globes. He studied geography from an encyclopedia and learned the fundamentals of engraving from Amos Doolittle of Connecticut. His experience as a blacksmith was helpful in casting and polishing the brass for the meridian rings. Wilson made his own tools, lathes, and presses, as well as ink, glue, and varnish.

James Wilson. Three inch terrestrial globe. Albany, 182-. (Item 27)

The first successful Wilson Globe was made around 1799 in his Bradford, Vermont, shop. Wilson's three sons opened a manufacturing plant in Albany, New York. Between 1810 and 1845 the Wilson firm produced many globes ranging in diameter from 8 to 51 centimeters. Most of the surviving examples are 33 centimeters in diameter. James Wilson died in 1855 at the age of eighty-three. his three sons predeceased him, and the albany plant was transferred to Cyrus Lancaster.

Josiah Loring, a Boston stationer, also engaged in globe manufacturing. There are extant today a number of celestial and terrestrial globes that carry Loring's imprint and date from 1832 to 1846. They range from 24 to 41 centimeters in diameter. Dwight Holbrook's School Apparatus Company of Boston produced school globes between 1810 and 1837.

Canal, Turnpike, and Railroad Maps

The urgent need for improved transportation between the various parts of the young and rapidly expanding nation, and pressures to develop and increase the material resources of undeveloped lands inspired far-reaching programs of internal improvements. Federal and state governments, syndicates, land promoters, and private individuals all contributed their knowledge, experience, energy, and financial resources to achieve the desired objectives. To plan, coordinate, and carry out the internal improvement programs, states set up planning and resource boards and employed skilled engineers and surveyors, most of whom were recruited in Europe. The internal improvement movement peaked during the second and third decades of the nineteenth century.

Construction of canals to improve and expand water transportation was one of the first goals of the internal improvers, and some canal surveys had been made as early as the decade preceding the revolutionary war. By the early nineteenth century most surveys for canals were made under the direction of state surveyors general, or by federal topographical engineers. Some of the resulting maps remained in manuscript form in official archives; others were published as supplements to congressional papers. In most instances the latter were engraved and printed by private establishments. Some commercially produced canal maps were designed to encourage recreational travel and to guide the tourist on his journey. Turnpikes were often included on such maps and railroads were shown after 1830. Representative of this type is the *Map of the Grand Erie Canal with the Stage Roads from Albany to Buffaloe, and the Distances between each Place, By S. Mahon. Drawn & Engraved for the Tourist, 1830.*

Maps were also prepared to inform the public of proposed canal projects and to trace anticipated routes. A profile of the proposed waterway was sometimes printed with the map, e.g., *Map of the Western Part of the State of New-York Shewing the Route of a Proposed Canal from Lake Erie to Hudson's River, Compiled by John H. Eddy from the Best Authorities 1811.* Commercial map engravers published general maps showing one or more types of transportation, such as Henry S. Tanner's *A New Map of New York with the Canals, Roads & Distances from Place to Place along the Stage & Steamboat Routes, 1840.*

Turnpike and road construction competed with canal and waterway projects for support. Similarly, turnpike projects involved the federal government; state boards, agencies, or departments; and private companies or syndicates. Proponents of canals and roads had their respective pressure groups and political supporters. Surveys for national and interstate roads were most often made by the Corps of Topographical Engineers or military engineers. The maps they prepared were usually reproduced by commercial engravers and printers and published in limited numbers with Congressional documents and papers. In this category is *Map of a Reconnaissance between Baltimore and Philadelphia Exhibiting the Several Routes of the Mail Road Contem-*

plated by the Resolution of Congress Approved on the 4th of May 1826. It bears the credit "S. Bernard Brigr. Genl. Member of the Board of Intl. Import. William Tell Poussin Capt. Top. Engs. and Assistant to the Board." The engraver is not indicated. Published in 1808 for general use, was William McCalpine's *Map of the State of New York Compiled from the Latest Authorities Including the Turnpike Roads now Granted as also the Principal Common Roads Connected Therewith. Intended as Well for the Student in Geography as a Directory to the Traveller.* Broader in areal coverage and subject matter is Henry S. Tanner's *The Traveller's Guide and Map of the Roads, Canals and Steam Boat Routes of the United States* which was published in 1825.

Railroad construction in America did not really get under way until the late 1830s; consequently only a few railroad maps were published during the engraving period. One of the earliest general maps showing rail lines in operation is Henry S. Tanner's *Map of the Canals & Rail Roads of the United States* which was engraved by J. Knight and published in 1830. In 1834 the *Railroad Journal* of New York City published a *Map of the Railroads and Canals, Finished, Unfinished and in Contemplation in the United States* which was compiled by William Norris. Also engraved was *Mitchell's Map of the United States: Showing the Principal Travelling Turnpikes and Common Roads . . . also the Courses of the Canals & Rail Roads throughout the Country,* Philadelphia, 1836. This map, which was printed on linen, is an early cartographic publication of one of Philadelphia's foremost nineteenth-century map and atlas publishers, Samuel Augustus Mitchell.

Town, County, and City Maps

In colonial America virtually every town or city had an official or semiofficial surveyor who surveyed and established new land holdings, confirmed boundaries and areas of existing ones, and drafted plans of the town for administrative and tax purposes. In some instances town surveyors were called upon to submit plans of their jurisdictions for use in compiling county or state maps. Most town plans remained in manuscript and were preserved in the archives of the town clerk. Only a very few were engraved and reproduced in multiple copies before the 1840s because of the high cost of engraving and the limited market for such reproductions. The earliest extant engraved town plan, which was of Stratham, New Hampshire, was prepared by Phineas Merrill in 1793. Merrill also prepared a plan of the town of Exeter, New Hampshire, which was published in 1802.

Town and city planning began almost as soon as the lands were occupied. Urban centers originated as ports for trade and commerce, religious communities, forts or military bases, and market places. Plans for many of the early towns were generally on European models. In some instances plans were drawn before the town was laid out. Most often the map or plan was prepared after the actual laying out of the settlement. By the beginning of the eighteenth century, a number of American city plans had been engraved and published in Europe. Many of these continued in use, with revisions and updatings, until some years after the Revolution. By 1785 some of the larger cities authorized surveys to encompass new settlements beyond the original city limits. One such was made for New York City by its surveyor Casimir Goerck, with the resulting map published in 1797. Between 1807 and 1811, a three-man commission, including state surveyor general Simeon DeWitt, made a comprehensive survey of Manhattan Island which extended the rectangular street plan. The so-called Commissioners' Plan was published in 1811.

John Hills, a British military engineer during the revolutionary war who remained in the United States, made a survey of Philadelphia in 1796 which was engraved in London and published the following year. The same year Charles Varlé—a geographer, engineer, and a native of France who immigrated to the United States via Haiti around 1794—prepared a map of

Philadelphia, a revised edition of which was published in 1802. *A New Plan of Boston from Actual Surveys* was prepared by Osgood Carleton in 1800. The new capital city of Washington laid out by Pierre Charles L'Enfant in 1791 received much attention from cartographers and engravers. The earliest published plans of the city, by Andrew Ellicott, appeared in 1792 in separate engravings by Samuel Hill of Boston and Thackara and Vallance of Philadelphia, both commercial engraving firms.

A town plan of Baltimore was published in 1799 by the local firm of Warner and Hanna. In 1823 a two-sheet map of the city based on official surveys by T. H. Poppleton was published. Plans of many other towns and cities were available before 1830. Whether these plans were based on official or private surveys or compilations, all were engraved and printed by commercial publishing firms, in Baltimore, Boston, New York, or Philadelphia. They were undoubtedly displayed in public places, but only the affluent had their own copies.

From the earliest years of the republic, the county was an important administrative and cultural unit. It was therefore inevitable that maps of such local jurisdictions would be prepared. The earliest extant examples of county maps were prepared by Charles Varlé, who settled in Philadelphia. He relocated in Maryland in 1798 where he engaged in canal construction for the next six or seven years. In 1801 or 1802 an unsigned *Map of the State of Delaware and Eastern Shore of Maryland ... From Actual Survey and Soundings Made in 1799, 1800, and 1801* was published which is believed to have been prepared by Varlé. His first county map, entitled *A Map of Frederick and Washington Counties, State of Maryland*, was published in 1808. It was engraved by Francis Shallus of Philadelphia who also prepared the plate for the map of Delaware. The Frederick and Washington counties map was published on a subscription basis for four dollars per copy. For an additional two dollars subscribers could have their "plantations, mills, &c marked on the map." This precedent of including names of land owners set a pattern for county maps published during the next sixty or seventy years.

In 1809 Varlé's *Map of Frederick, Berkeley, & Jefferson Counties in the State of Virginia* was ready for distribution. Although similar in appearance to the map of Maryland counties, this one was engraved in Philadelphia by Benjamin Jones. In a descriptive booklet prepared to accompany the Virginia map, but not published until 1810, Varlé noted that he prepared the map and supplementary booklet for farmers "who contemplate emigrating to the Western country; as it is obvious, that the circulation of it, will afford, to those disposed to purchase property in those counties, some data, whereby to estimate its value, and consequently enable those disposed to sell, to obtain the real value for their property." In 1817 Varlé published a large *Map of the United States Partly from New Surveys*, which was engraved in Philadelphia by J. H. Young. An 1835 edition was published by R. Stebbins of New York. Varlé's last known effort is *A Complete View of Baltimore with a Statistical Sketch* which was published in 1833 with a plan of the city. Shortly thereafter Varlé returned to France, where it is assumed that he lived out his life.

A *Map of Wayne & Pike Counties, Pennsylvania*, by Jason Torrey, copyrighted April 7, 1814, appears to be next in priority among county maps. It differs from Pennsylvania county maps published during the following decade and apparently was prepared before the 1816 "Act Directing the Formation of a Map of Pennsylvania" was enacted. In contrast with later county maps, Torrey's had numbered land tracts which were keyed to names of landowners listed in an accompanying seventy-eight-page booklet. Some ten or twelve of the county maps used by John Melish to compile the 1822 *Map of Pennsylvania* were published by Melish and Tanner between 1820 and 1830. The judicial district (i.e., county) maps from which John Wilson's 1822 map of South Carolina was compiled were engraved by Tanner and assembled into an atlas of the state which was published by Robert Mills. Separates of the individual

maps were also offered for sale by Mills. Little interest in county maps was evident at this time, and during the next ten or fifteen years few if any were published.

Coastal and Navigation Charts

For several decades following independence, the major commercial ties of the young American republic were with Europe. There was also considerable coastal trading among the several states on the eastern seaboard. During the decades following the War of 1812, well-constructed ships and competent mariners established a high reputation for America's merchant marine. Also contributing to this supremacy were detailed and reasonably accurate charts and navigation guides.

The first official hydrographic office, the British Admiralty, was not established until 1796, and before and after this date mariners relied upon private publishers for charts and other navigation aids. During much of the eighteenth century mariners sailing between Europe and North America were dependent upon sailing guides and bound volumes of charts. For more than a century, from 1689 to 1794, British navigators followed the *English Pilot; the Fourth Book* for navigating the North Atlantic. The *English Pilot* was published successively by John Sellers, and William Fisher and John Thornton. To the misfortune of many mariners, only minor corrections were made in the charts of the *Fourth Book* in the thirty-seven separate editions.

Immediately preceding and during the revolutionary war British military engineers, under the direction of Joseph Frederick Wallet Des Barres, conducted surveys of the coastal waters of North America. The resulting charts, some 260 in number, covered the harbors and coasts between Nova Scotia and Florida. The groups of charts which were assembled and bound at the request of individual ship commanders came to be known collectively as the *Atlantic Neptune*. These charts served American mariners for several decades after independence, either in their original form or in sailing guides and charts which plagiarized their information. The several editions of *The American Pilot* published between 1792 and 1803 by John and William Norman were in the latter category. Several charts in the Norman volumes were compiled from the *Atlantic Neptune* and other English sources by Osgood Carleton.

Before publishing their own marine atlases, John and William Norman and Joseph Seymour engraved charts for Matthew Clark's *A Compleat Chart of the Coast of America* which was published at Boston in 1789. This is considered to be the first totally American pilot or book of charts. After 1795 the Norman and other American chart books gradually supplanted English charts and pilots on ships of the new republic. During much of the nineteenth century the American merchant marine utilized charts and pilot books prepared by such English publishers as Laurie and Whittle, and John William Norrie for navigating foreign waters.

For seven decades, from 1796 to 1866, American mariners depended primarily upon navigation books and charts of coastal waters published by Edmund March Blunt, his sons Edmund and George, and his son-in-law William Hooker. The senior Blunt, who previously was engaged in printing and selling religious books and navigational aids in Newburyport, Massachusetts, employed a local mariner, Capt. Lawrence Furlong, in 1795 to prepare a book of sailing directions. The first edition of *The American Coast Pilot* was published by Blunt in 1796. Second and third editions were published in 1798 and 1800. The first three editions were limited to "directions" and included no charts. The fourth edition, published in 1804, had grown to 386 pages and included eleven engraved charts compiled from earlier works. In the 1820s, however, Blunt had a number of surveys made of harbors along the eastern seaboard. Blunt also prepared coastal charts which were based on surveys made around 1812. These were withheld from sale until after the War of 1812, when one seven-sheet and six

single-sheet charts were published. Eighteen charts were listed in Blunt's 1822 catalog, after which date only four more were added up to 1852. Fourteen charts were included in a bound volume entitled *Charts of the North and South Atlantic Oceans, the Coast of North and South Carolina and the West Indies* which was published by E. and G. W. Blunt in 1830. The sixth edition of *The American Coast Pilot*, published in 1809, was the last with a Newburyport imprint. In 1812 Blunt moved his establishment to New York City. Blunt's sons assumed management in 1826 and continued publication of the *Pilot* through the twenty-first edition in 1867.

In 1799 Blunt issued a pirated edition of John Hamilton Moore's *The New Practical Navigator*, an English publication. With some corrections supplied by Nathaniel Bowditch, a Newburyport mariner, mathematician, and insurance company official, Blunt published the second edition in 1800. The third edition, retitled *The New American Practical Navigator* and with Nathaniel Bowditch's name on the title page, is dated 1802. Editions of *The Navigator* were published until 1867 when it and *The American Coast Pilot* were sold to the U.S. Coast Survey and the newly established U.S. Hydrographic Office. In the preface to the twenty-first and last edition of the *Pilot*, published in 1867, George W. Blunt noted that "the furnishing of nautical information is the duty of the government, and ought to be performed as it is in other countries." Before the government assumed this responsibility, the Blunts supplied American mariners with comprehensive and accurate sailing directions, navigation aids, and charts for almost three-quarters of a century. Because navigation guides and charts are subjected to intensive use their attrition rate is high and full runs of Blunt's publications are quite rare.

The country's primary river systems, particularly those west of the Appalachians, constituted major routes of transportation as early as the seventeenth century. Westward movement was accelerated following the revolutionary war, particularly in the early decades of the nineteenth century. Keelboats and barges, some with sails, were the vessels which transported people and goods down the Ohio and Mississippi waterway from Pittsburgh, Wheeling, and other places of origin to New Orleans and river ports along the way. Flatboats and barges were unable to make the return trip up-stream and were usually sold for lumber at journey's end.

River navigational aids were essential to negotiating treacherous and fluctuating water courses. One of the first who sought to fill the need was Zadok Cramer, a Pittsburgh printer, bookbinder, and bookstore proprietor. In 1801 he published, in Pittsburgh, the first edition of the *Ohio and Mississippi Navigator* which included printed directions and notes, reportedly derived "from the Journals of Gentlemen of Observation." The first four editions had no maps. The fifth edition, newly titled *The Navigator*, was published in 1806. In it thirteen rather crude page-size maps were interspersed with the "directions." *The Navigator* ran through twelve editions, the last in 1824. Following Cramer's death in 1813 the guide was published by his widow and Cramer's former partners. The later issues include, in addition to the directions, much miscellaneous information such as explorers' accounts, information for settlers, and notes about the scenic sites and "curiosities" along the way.

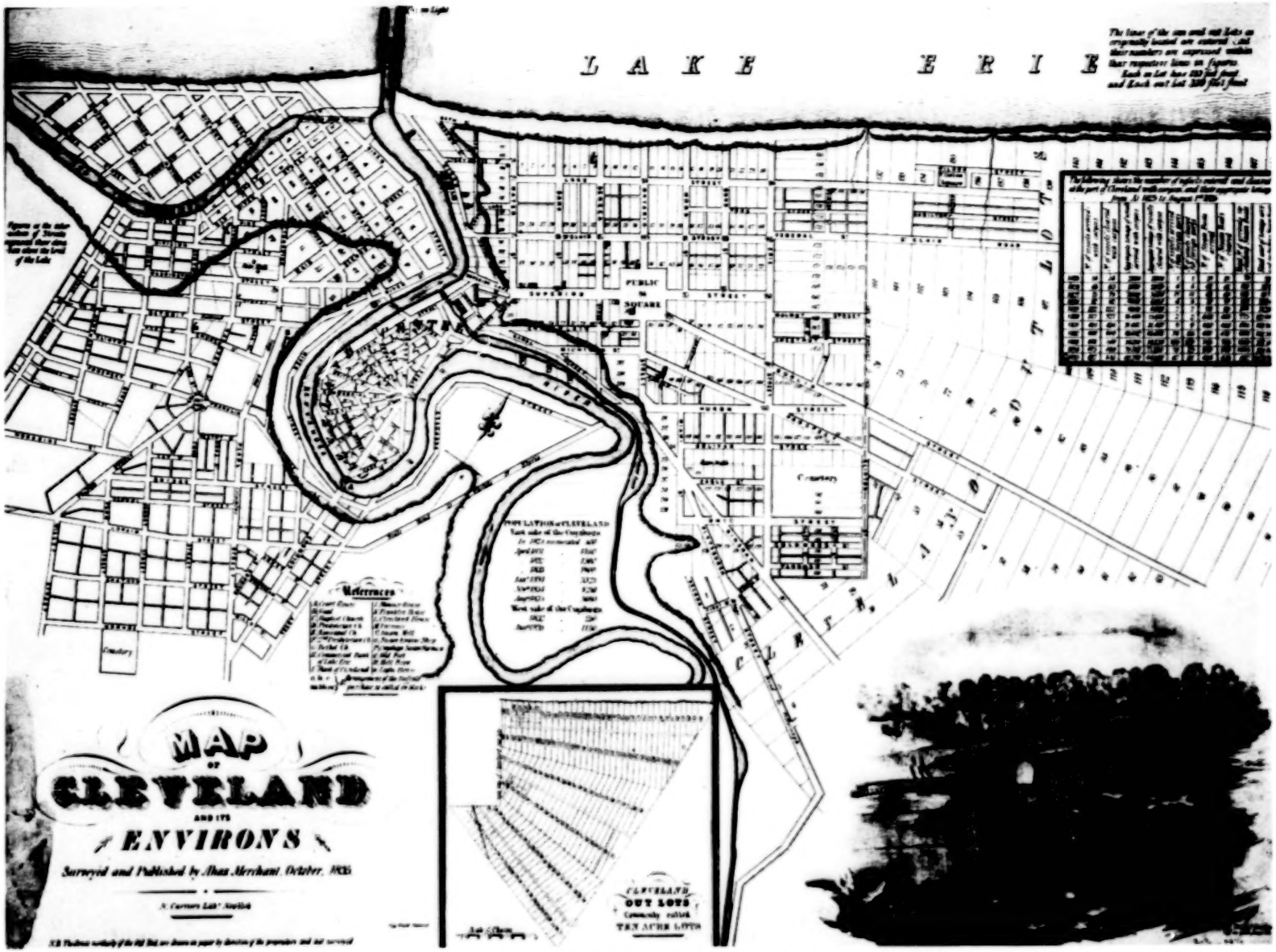
Two years before the demise of *The Navigator*, Samuel Cumings introduced the *Western Pilot* which ran through ten editions up to 1854. The *Pilot* included less textual information than *The Navigator*, but the charts in the former were more accurate and attractive. Cumings's charts were engraved by Henry Schenck Tanner of Philadelphia, one of the leading map engravers and publishers of the period.

Exploration and Private Cartography

The early decades of the nineteenth century witnessed a number of exploratory surveys beginning with those of captains Meriwether Lewis and William Clark between 1804 and 1806. In

1813 the Corps of Topographical Engineers was established within the War Department and it was soon heavily involved in exploring, surveying, and mapping the extensive western lands. Topographical engineers also prepared surveys of canals, roads, and railroads in the eastern part of the country.

Some of the maps resulting from these and other early surveys were never published and are preserved only in manuscript format in the National Archives or other repositories. Others were issued with documents or reports published for the Senate or House of Representatives. With no federal map agencies functioning at this period, the maps were engraved (after 1828 some were reproduced by lithography) and printed by private cartographic firms. Thus, a *Map of the Creek Territory in Alabama from the United States Surveys* by John L. Tourrette was engraved and published by S. Stiles and Company around 1833. Similarly a *Map of the Late Surveys in the Northern District of the Alabama Territory* by surveyors Peel and Sannoner was published around 1818 in Philadelphia by Tanner, Vallance, Kearny & Company. Pendleton's Lithography of Boston published in 1827 or 1828 a *Map of the Country, Embracing the Several Routes Examined with a View to a National Road, from Zanesville, Ohio to Florence, Alabama for Col. Long's Brigade* . . . by Lt. Walter Gwynn, 4th Artillery. A. Finley of Philadelphia published in 1826 a *Map of North America Including All the Recent Geographical Discoveries* which was drawn by D. H. Vance and engraved by J. H. Young. A number of maps recording explorations and new discoveries were also published as illustrations in various books, both scientific and popular.



Ahaz Merchant. Map of Cleveland . . . . New York, 1835. (Item 51)

The Industrial Revolution and Cartography ca. 1830–1865

Lithography and Cartography

In the three decades preceding the Civil War, private cartography expanded phenomenally in response to various social, political, and technological developments. The nation's population increased 300 percent between 1810 and 1850 from natural growth and immigration. With better transportation, resulting from the active internal improvement programs of the previous two decades, westward movement greatly accelerated. A number of new states were added to the republic before the Civil War. Texas was annexed in 1847 following the Mexican War, and gold was discovered in California in 1848. Overland migration to Oregon and California began around 1841. All these factors greatly stimulated the production and use of maps. Fortunately, new technological inventions and improvements contributed to more accurate and rapid surveying and compilation and reproduction of maps in greater quantities at lower cost.

For more than three hundred years maps were printed from copperplates on which the image was skillfully and carefully engraved in reverse. This was a costly and tedious process and, therefore, the number of maps published was limited. Moreover, the soft copperplates could survive only a few thousand impressions at most. Before the close of the eighteenth century, various European inventors and technicians sought to develop more expeditious and less costly techniques for reproducing graphic material. The first to achieve practical results was Alois Senefelder who developed the technique of lithography in Munich around 1796. During the next two decades Senefelder carried out numerous experiments relating to materials, equipment, and applications of the lithographic process. So thorough were his researches that he asserted in his *A Complete Course of Lithography*, published in 1819, that "beside myself . . . no person, in all the different branches of Lithography, has effected any new improvement of consequence, which he had not received directly, or indirectly, from me; that all those artists, and producers of prints, made their first essays under my immediate direction, or were trained and instructed by persons who derived their information from my instructions." There was some justification in Senefelder's assertion, but printers and technicians in Germany, France, Austria, England, and other European countries also made significant contributions to the lithographic process. By 1820 lithography had been introduced in some fifteen or twenty European cities. Maps were among the early graphics reproduced by the new printing process, but before 1820 there were few plants exclusively occupied with reproducing maps.

In contrast with earlier printing processes, which utilized copperplates with incised surfaces or woodblocks with raised images, lithography is a planographic process, i.e., the printed image is taken from the same surface plane on which the original design has been formed. By 1825 the lithographic process had become more or less standardized. Using a lithographic crayon, maps and other graphics were first drawn or traced on a

smooth, limestone surface. Water was then wiped over the surface of the stone, forming a thin film on the area that had not been greased by the crayon. When a roller charged with ink was passed over the moistened stone, the ink would leave the roller and adhere only to the greased image. Next, paper was pressed against the stone, and the inky image was printed on the paper.

Lithography was not introduced to America until the 1820s by which time the techniques and procedures were quite firmly fixed. Printers and publishers in the United States adopted the process, with little or no change, and their dependence upon European lithography and lithographers contined until well past the middle of the nineteenth century.

A page-sized plan entitled "Barton on the Catskills" is believed to be the earliest map reproduced by lithography in the United States. It illustrated a paper on the geology of the Catskill Mountains which was published in the fourth issue, 1822, of the *American Journal of Science and Arts*. The map and other illustrations in the *Journal* were printed in the New York lithographic shop of William A. Barnet and Isaac Doolittle. As was true for other early American lithographic printing firms, the Barnet and Doolittle partnership was short-lived.

During the next five or six years other lithographic maps were published in journals and monographs. In the latter category were four maps by Anthony Imbert of New York City, which illustrated Cadwallader D. Colden's *Memoir* (1825) commemorating completion of the Erie Canal. Only a few separate maps were printed by the new process before 1830. One of these rare exceptions is H. Ball's *Map of the Military Bounty Lands in the State of Illinois* which was "Drawn on Stone & Printed by M. Williams, 65 Canal St. N. York 1827."

American engravers, understandably, took an early interest in lithography and some added lithographic printing to their range of services. William S. Pendleton, who operated an engraving plant in Boston with Abel Bowen, dissolved that partnership in 1825 or 1826 and continued in business with his brother John who had received some training in lithography in France. The Pendleton firm survived for more than a decade and was the most successful of the early lithographic establishments. What appears to be the Pendleton's first cartographic effort is a facsimile reproduction of the "Wine Hills" version of John Foster's woodcut map of New England, first published in 1677. The Pendleton lithograph, based on a manuscript redraft by M. Swett, is the frontispiece in Judge John Davis's annotated edition of Nathaniel Morton's *New England Memorial* (1826).

In 1830 the Commonwealth of Massachusetts, to obtain compilation material for a new map, passed an act requiring towns and cities to deliver, within one year, detailed and accurate surveys of their respective jurisdictions. The resulting map, compiled by Simeon Borden, was published in 1844. Like earlier state maps it was printed from copper-engraved plates. The Pendleton firm obtained copies of the manuscript town plans and printed more than twenty-five of them by lithography between 1829 and 1836. Others were similarly printed by the short-lived Senefelder Lithography Company, which was absorbed in 1830 by Pendleton's. Pendleton Lithography also printed maps in the late 1820s and early 1830s that illustrated reports of the two houses of Congress. The firm also published a 5-inch globe around 1835. William Pendleton sold his business to Thomas Moore in 1836. (John Pendleton had left the firm several years earlier.) During the twelve years or so that the Pendletons were active they printed an estimated seventy-five or more maps as well as a number of prints and other illustrations.

In 1828, a fifteen-year-old apprentice, Nathaniel Currier, was employed by the Pendleton company. After five years of apprenticeship, Currier moved to Philadelphia where he spent a year with M. E. D. Brown, a master lithographer. In 1835, at the age of twenty-two, Currier opened his own lithographic shop at One Wall Street in New York City. Maps were among his earliest printed works, among them Ahaz Merchant's *Map of Cleveland and Its Environs* (1835), *Map of the Western Land District*

Wisconsin, 1836, *Map of the Northern Part of Illinois and the Surveyed Part of Wisconsin Territory* (1836), and *City of Detroit, Michigan, 1837*. Currier also prepared maps for book illustrations, including some sixty of page size for James F. Smith's *The Cherokee Land Lottery*, published in 1838. Because of the great popularity achieved by his views and prints, Currier printed few maps during the next two decades. However, in the eighth and ninth decades of the nineteenth century Currier and Ives did publish a series of panoramic maps of some of the larger cities of the United States.

The publishing houses of S. Augustus Mitchell and J. H. Colton were the dominant producers of maps and atlases from around 1840 to 1880. Many other lithographers and map publishers, however, were also active during these years and made significant contributions to the development of American private cartography. Engraving required a close relationship between the cartographer and the printer. This was less essential with the lithographic process. In consequence, lithographers concentrated on perfecting reproduction techniques, which allowed the mapmaker to devote his energies to surveying, compilation, and drafting. To bring together the two groups of craftsmen there evolved a third profession, the entrepreneur or middleman who sometimes also functioned as publisher and/or contract negotiator. In some instances the cartographer also acted as the publisher and producer.

Among the French lithographers who prospered in the United States was Peter Duval, who immigrated to New York City around 1828. In 1831 he relocated in Philadelphia where he was employed by the firm of Cephas G. Childs and Henry Inman. George Lehman also joined the company about this time, and in 1834 he and Duval assumed control, probably shifting the emphasis from engraving to lithography. From 1839 to 1843 Duval was in partnership with William M. Huddy. Duval conducted various experiments designed to improve lithographic techniques and increase their application. He and J. H. Richards produced a colored lithograph that was published in the April 1843 issue of *Miss Leslie's Magazine*. Duval also pioneered in zincography and in 1849 he was the first printer to install a rotary steam press. The Duval firm lithographed maps as early as 1835, and during the next four decades numerous maps and other graphics rolled from its presses. Duval was, however, a lithographic printer and not primarily a map publisher.

Frederick Bourquin, a native of Berne, Switzerland, emigrated to the United States in 1819 and settled in Bucks County, Pennsylvania. He subsequently moved to New York City and thence to Philadelphia. Around 1845 he was a foreman in Duval's lithographic company. Bourquin, like Duval, carried out various experiments in printing, and in 1847 the Franklin Institute awarded him a prize for the "great neatness, beauty, and accuracy of execution," of transferred engravings. Following a disastrous fire in the Duval plant in 1856, Bourquin established his own lithographic business. He published maps and prints for various publishers, including the federal government, and also issued a number of maps under his own imprint during the next several decades. Bourquin resided in Camden, New Jersey, after 1851 and died there in 1893. He attained prominence in the city and state and was elected to the New Jersey legislature.

Augustus Kollner, a native of Württemberg, Germany, learned the engraving craft at an early age, emigrated to America in 1839, worked briefly in a lithographic plant in Washington, D.C., then settled in Philadelphia. After an unsuccessful venture as a portrait painter, Kollner worked as a free-lance illustrator for Peter Duval, drawing maps and other illustrations. In 1847 he joined the copperplate and lithographic firm of Brechemin and Camp. Four years later Kollner was managing his own engraving and lithographic establishment. In contrast with Duval and Bourquin, Kollner was reluctant to adopt such new techniques as chromolithography and the rotary steam press; consequently his business deteriorated.

In 1835 Edward Weber, also a German, established a lithographic printing plant in Baltimore. In 1840 Weber's

nephew August Hoen joined the firm. After Weber's death in 1848 Hoen became proprietor and in 1853 the firm's name was changed to A. Hoen and Company. It still continues in business in Baltimore under this name. In 1848 Hoen printed, on contract for the U.S. government, maps to accompany W. H. Emory's *Notes of a Military Reconnaissance from Fort Leavenworth ... to San Diego*. During the succeeding 130 years the Hoen firm has printed hundreds of maps; some for the National Geographic Society have had runs in the multimillions.

During its first two decades or so, American lithographic printing was primarily limited to direct printing from stone plates. The image had to be drawn with greasy ink or crayon in reverse on the stone, from which it was printed on paper. Although Senefelder and other European lithographers had already demonstrated this process, it appears that the transfer technique was not widely employed in the United States before 1847.

There is some evidence to indicate that the transfer process was introduced through anastatic printing. This procedure, too, was developed by Senefelder, who called it autography. The procedure was reintroduced around 1840 by Charles Frederick Baldamus of Erfurt, Germany. It received minimal attention in Germany, but in 1844 Joseph Woods took out English patents on the process, which he called anastatic printing. It was originally regarded as a medium for facsimile reproduction of previously printed letterpress, illustrations, or maps. It was soon discovered, however, that new drawings prepared with proper ink could be transferred to a zinc plate from which copies could be made. In April 1845, Michael Faraday demonstrated anastatic printing at the Royal Institution in London. Among the fascinated observers were John Jay Smith, librarian of the Library Company of Philadelphia, and his eighteen-year-old son, Robert Pearsall Smith. Before returning to Philadelphia, the elder Smith secured the American license for anastatic printing and purchased a press and other supplies and equipment. Early in 1846 he established an anastatic printing shop in Philadelphia which was directly supervised by Robert. The shop engaged in various types of reproduction, most significant of which were facsimiles of Thomas Holme's *Map of the Province of Pennsilvania*, originally surveyed in 1681 at the direction of William Penn, and John Reed's 1774 map of Philadelphia. Both reproductions were published in 1846 in limited editions of 200 copies.

The anastatic printing shop was apparently not financially successful and closed within a year. Not, however, before two of its procedures, i.e., the transfer process and the use of zinc plates instead of heavy, fragile, stone slabs, had been adopted by lithographic printers in Philadelphia. It should also be noted that the two facsimile maps noted above were not reproduced from the original engraved maps, but from hand-drawn tracings or copies. The manuscript drawings, prepared with greasy anastatic ink, were transferred to zinc plates from which they were printed in the anastatic press. Robert Pearsall Smith early made the acquaintance of Bourquin, and other Philadelphia lithographic printers. It is quite possible, therefore, that Bourquin, who had produced prize-winning improved lithographic transfers, borrowed the zinc plate and transfer techniques from the anastatic process and applied them to lithographic printing. Certainly, after 1847 lithography as applied to map printing experienced a great resurgence, particularly in Philadelphia.

General Maps and Atlases

Lithographic reproduction of maps made considerable progress during the 1830s, but engraving persisted through this decade and into the fourth. Editions of Tanner's atlases continued to be published until 1839, and some maps with the Tanner imprint are dated as late as 1845. Similarly, maps and atlases by David H. Burr were issued through the thirties, and there are 1839 and 1841 editions of his *Atlas of New York State*.

Philadelphia, which was the principal center of cartographic publishing during the engraving period, retained its supremacy after the introduction of lithography. In general cartographic publishing, Henry S. Tanner was succeeded by Samuel Augustus Mitchell, who was born in Bristol, Connecticut, in 1792 and taught until the late 1820s. He settled in Philadelphia around 1828 where he was initially engaged in writing and publishing geograpical works. Mitchell undoubtedly had some contact with Tanner, but he probably was not associated in business with the latter, as certain sources suggest. He seems, however, to have acquired rights to some Tanner maps around 1845.

The earliest cartographic publications bearing Mitchell imprints date from 1831. They include several maps as well as *A New American Atlas . . . of the United States of North America . . . published by S. Augustus Mitchell, Philadelphia, 1831*. The atlas has thirteen maps which are folded within covers measuring approximately 16 by 11 centimeters. All were reproduced from engraved plates and carry the credit line "J. H. Young, Sc." Whether the maps in the atlas were compiled by Mitchell or by Young is unclear. Certain of the maps were also published as separates, e.g., *Map of Massachusetts, Connecticut and Rhode Island*, which appeared in editions dated as late as 1850 with S. A. Mitchell imprints as well as those of other publishers. Editions issued up to 1843 carry the J. H. Young credit. On later issues Young's name has been removed, suggesting that the map had been transferred to stone from which lithographic reproductions were made.

During the transition from map engraving to lithography transferring engraved maps to stone was a fairly common procedure, especially in the latter half of the 1840s. Henry S. Tanner's 1834 map of Connecticut, for example, subsequently was published in lithographic editions by H. S. and T. R. Tanner in 1839, Carey and Hart in 1841 or 1842, and S. Augustus Mitchell in 1846. A decorative border added to the last appeared on most subsequent Mitchell maps. Tanner's *Connecticut* was also reproduced by cerography under Morse and Breese in 1842.

From 1846 on, Mitchell maps and atlases appeared in great numbers. The *New Universal Atlas*, first published in that year, continued up until 1859 with editions virtually every year. It reappeared as the *New General Atlas* in 1864 and continued until 1893, twenty-five years after Mitchell's death. It is estimated that as many as 400,000 copies of Mitchell atlases were sold, and during the years of maximum production the firm employed as many as 250 persons.

It is not clear to what extent steel engraving was employed for Mitchell maps and atlases. Several maps do include the statement, "Engraved on Steel by J. H. Young and D. Haines." No comparable statement was found on the title page or in the introduction of any of the editions of Mitchell atlases examined. The title page of the 1852 edition of Mitchell's *New Universal Atlas of the World* is a chromolithograph by P. S. Duval. Subsequent editions also included this title page. Duval pioneered in U.S. chromolithography, and the 1852 title page is an early example of his work.

In 1831 Joseph Hutchins Colton established a geographical and cartographical publishing house in New York City. His son, George Woolworth Kolton, was associated with him at first and later succeeded to the business. For the first two decades the firm published geography textbooks and by 1848 it was also producing maps. Colton's first cartographic products were large maps of the United States and the world. A world map was originally published in 1847 by D. Griffing Johnson and it includes a decorative border as well as several engraved illustrations. The title cartouche has the statement "Steel Plate Map." This identification is included in the cartouches of some of the world maps with Colton's imprint as late as 1868. The U.S. map does not carry this statement, but it includes similar finely engraved illustrations and was "engraved by John M. Atwood" and drawn by George W. Colton. It is possible that Colton purchased from Johnson the copyright to the

world map as well as permission to use the steel engraving technique. Steel had been used for engravings as early as 1810. This metal was more durable than copper but more difficult to engrave. For this reason it was initially only used for bank notes and other small documents. By means of siderography, a technique invented around 1808, engravers could work on soft steel which was subsequently hardened.

Colton issued his first atlases in 1855 and continued publishing them as late as 1884. They include extensive geographical descriptions and the maps are ornamented with decorative borders of intertwining vines. It is not clear which type of reproduction was used for the 1855 and 1856 editions. "New York Stereotype Association" appears on the 1855 title page. All editions from 1857 to 1874 have titles similar to the following: *Colton's General Atlas—Containing One Hundred and Seventy Steel Plate Maps and Plans on One Hundred Imperial Folio Sheets.* The number of plates increases in later editions. It is not certain whether the maps were printed directly from steel plates or if stereotypes were made for use in rotary presses. As for the large wall maps, the latter technique seems more likely. Reference to steel plates is omitted in editions from 1877 to 1888. It is possible that these editions were reproduced by the wax engraving technique which was widely used for atlas publishing after 1870.

Supplementing the cartographic output of such major firms as S. A. Mitchell and J. H. Colton were a number of smaller publishers, some of whom prepared maps of fairly limited locales. The Farmer company, founded around 1825 by John Farmer, was one in the latter category. During the next thirty-five or forty years Farmer published, in various scales and editions, maps of Michigan, Wisconsin, and bordering states, as well as of Detroit and its environs. Following John Framer's death in 1859, the company continued in business, first under Farmer's widow, Roxanna, and after 1864 under his son, Silas. Early Farmer maps were reproduced from copperplates, some of which were personally engraved by John Farmer. Later editions, including most of those dated after 1845, were lithographed. Some maps from the early forties, originally printed from engraved plates, were transferred to stone or zinc for lithographic reproduction. Colton secured the copyright on several Farmer maps and published them under his own imprint.

Wax engraving, or cerography, was developed between 1834 and 1839 by Sidney Edwards Morse (son of Jedediah Morse) and was first applied in 1839 to print the *Cerographic Map of Connecticut.* Independently, or in collaboration with Samuel Breese, Morse published the *Cerographic Atlas of the United States* (1842), *North American Atlas* (1842-[45]), *Cerographic Bible Atlas* (1844), and *Cerographic Missionary Atlas* (1848). The cerographic atlases, which were rather unattractive and printed on poor quality paper, were not popular. Morse was secretive about the process and thus it did not benefit from the ideas and experience of other printers. Wax engraving was improved upon and revived between 1850 and 1870 and became one of the most widely used techniques for printing atlases until well into the twentieth century. In addition to its low cost of production, wax engraving and the stereotype plates which it produced could be used to print letterpress and graphics on the same sheet.

Besides large wall maps and atlases, Colton and other publishers produced a great number of regional, state, and city maps. Colton's production of railroad and guide maps was prolific, and the firm is credited with having produced at least a third of all such maps sold from 1848 to 1882. Beginning around 1835, and continuing for the next fifty years or so, various publishers issued maps on thin "bankers" paper folded between simulated leather covers measuring about 3 by 5 inches. Within some of the covers there is descriptive and statistical information. In this category are the *Travellers' Guides*, published in the 1850s by Ensign, Bridgman & Fanning (variously Ensign & Thayer) of New York City, and such works as Mitchell's *Travellers' Guide Through the United States*,

published in 1837. This map, which is accompanied by a descriptive booklet and index, was engraved on steel by J. H. Young and D. Haines. Pocket maps were exceedingly popular and were purchased and used in great numbers during the same period.

Town, County, and City Maps

The production of town, county, and city maps and plans was quite limited in the United States before 1850. We have noted Charles Varlé's early efforts at preparing county and city maps, the county maps of Pennsylvania published by Melish and Tanner, and the maps of Massachusetts towns which were among the early cartographic products of Pendleton's Lithography in Boston. These individuals were in advance of their time because the most urgent demand during the first fifty years of the republic was for state maps, and because reproducing maps from engraved copperplates and lithographic stones was costly and tedious. Widespread adoption of the transfer process, substitution of lightweight zinc plates, and accelerating interest in maps of local areas resulted in the very profitable production of town, county, and city maps in the fifties and sixties. These maps, most of which are of wall-map dimensions, provide greater detail and more comprehensive information than any previously published American maps. Many include the names of individual owners of urban property and rural farmsteads and are often decorated with illustrations of historic sites, scenic attractions, public buildings, churches, and even private residences. Thus, they comprise an unexcelled means of studying local history and genealogy during the middle of the nineteenth century. Because the maps were privately published, with the expectation of profitable sales, the best coverage is of the more populous and affluent regions of the country, i.e., New England, the middle Atlantic states, the Ohio Valley, and the upper Mississippi River states.

A number of surveyors, cartographers, illustrators, lithographic printers, and publishers were involved in the local map business. Some participated for brief periods and were associated with just one or a few maps, whereas others produced hundreds of different maps and operated highly successful cartographic establishments over a long period of years. In the latter category is Henry Francis Walling who, between 1848 and 1864, published several hundred town, county, and city maps of all the New England states, as well as a number for the middle Atlantic states, Ohio, and Michigan. Walling was born in Burrillville, Rhode Island, June 11, 1825. Following fundamental training in mathematics and engineering, he became a partner of civil engineer Barrett Cushing of Providence in 1846. One of his early assignments was to conduct a survey and prepare a map of the town of Northbridge, Massachusetts, which was published by town officials in 1848. Within the next several years he completed maps for some thirty Massachusetts towns and cities. In 1850 Walling published, with O. Harkness and J. Hanson, his first county map—Newport County, Rhode Island. Maps of Bristol and Providence counties, Rhode Island, were published the following year. Walling personally carried out the surveys for these early maps with standard surveying instruments of the period, the compass and transit. To expedite distance measurement, the odometer was substituted for the surveyor's chain. The odometer consisted of a wheel attached to a mechanical device which recorded the revolutions of the wheel. The instrument was either pushed by the surveyor, after the fashion of a wheelbarrow, or attached to a horse-drawn carriage.

The success of his map surveying and publishing enterprises induced Walling to dissolve his partnership with Cushing in 1852 and establish independent mapping headquarters in Boston. Following completion of plans for all the towns in Massachusetts, in 1854 Walling initiated a project to prepare a map of each county in the state. By 1858 maps had been published for all the counties. Anticipating the completion of surveys and maps for most of the towns in New England, in 1856

Walling relocated his mapping establishment in New York City. During the next five years his men conducted surveys and prepared maps for selected counties in Ohio, Indiana, Illinois, Wisconsin, Pennsylvania, New York, and New Jersey. By this time, however, other mapmakers had already mapped many counties in these states. Walling's New York shop reportedly provided all the steps in map drafting, printing, coloring, and mounting, and its maps were reproduced by a great number of lithographic printers. Many of Walling's Massachusetts town plans were printed at Kollner's lithographic plant in Philadelphia. He used several Boston lithographers for some of his earlier maps, but relied most frequently on firms in New York City for much of his lithographic printing.

Another individual who made a major contribution to county and city map publishing in the two decades preceding the Civil War was Robert Pearsall Smith, John Jay Smith's son. Their experience in printing several maps with the anastatic press encouraged them to enter the map publishing business. The father initially provided the financial support and Robert operated the business. In contrast to Walling, Robert P. Smith had no training or experience in surveying or drafting. Therefore, the part he played was of a liaison, or middleman, between surveyors and map printers. In his active years he became acquainted with most of the map printers in Philadelphia. Excluding those done on the anastatic press, the first map published by the Smiths was *Ten Miles around Philadelphia*, issued in 1847. This was drawn by J. C. Sidney, an English-trained civil engineer, who was employed as a part-time assistant in the Library Company of Philadelphia for a brief period. Sidney went on to prepare a number of attractive county and city maps during the next six or seven years.

By 1850, local surveyors were beginning to prepare maps of counties in Pennsylvania, New York, New Jersey, and other states. Robert P. Smith provided many with lithographic ink to use in drafting their maps and copies of the published map. Smith usually copyrighted the map in his name and had it printed by such Philadelphia lithographic firms as those of P. S. Duval and Frederick Bourquin. Frequently the Smith name only appears in the copyright notice on a map.

Around 1854 Smith, in collaboration with several associates, conceived the idea of having a law enacted by the New York State legislature to require all schools in the state to purchase a map of their home county as well as one of New York State. Smith negotiated contracts with surveyors in all counties to prepare surveys for maps which would be published by Smith's company. The county maps were to be used in compiling a large up-to-date map of New York State. Compilation of the state map was entrusted to John Homer French who had prepared several county maps. The map proposal apparently had strong support in the legislature and seemed to be on the verge of enactment. For unknown reasons, the proposal was tabled in committee at the close of the 1856 session and was never reactivated. Nonetheless, Smith continued with the state map project and compilation of a gazetteer which was also under French's direction. The map and gazetteer were both published in 1859. In the preface to the gazetteer it is stated that the cost of the original county surveys was $48,000 and compilation of the map and gazetteer required an additional investment of $46,000, a total of $94,000. This was a considerable outlay for the period especially since, with the outbreak of the Civil War, the market for maps and gazetteers was depressed. This was, accordingly, the last major cartographic effort of Robert P. Smith. Then, Matthew Fontaine Maury's large *Washington Map of the United States* was published in 1860. H. G. Bond is listed as publisher, but the map was copyrighted by Robert P. Smith. Because Maury, a native Virginian, served with the Confederate forces in the Civil War, his name was removed on subsequent editions of the map. During Smith's active period as a cartographic publisher, he is believed to have been associated with the preparation of four or five hundred maps. In 1865 he took over the management of the Millville, New Jersey,

plant of the Whitall-Tatham Glass Company, the senior partner of which was Smith's father-in-law.

Robert Pearsall Smith and Henry Francis Walling were probably responsible for more than 60 percent of the town, county, and city plans published in the United States between 1848 and 1864. Several hundred other individuals, however, contributed to this very productive cartographic output. Only a few of the surveyors whose names appear on several or more maps can be recorded here. In New England, in addition to Walling, there were Sidney and W. J. Baker, J. Chase, Jr., and L. Fagan. New Yorkers were particularly active, and French's *Gazetteer* lists more than forty surveyors and statisticians whose works were drawn upon to compile French's map of New York State. Among others, the list includes Silas N. Beers, Lorin Blodget, Lawrence Fagan, John F. and Samuel Geil, Franklin B. Hough, D. J. Lake, J. B. Moore, Samuel M. Fea, and J. C. Sidney. Sidney also prepared maps of Pennsylvania counties and cities, as did S. N., F. W., and J. M. Beers, Henry F. Bridges, and G. M. and H. W. Hopkins. Several of these surveyors also worked in New Jersey.

Railroad and Immigrant Maps

The three decades from 1830 to the Civil War witnessed great activity in railroad construction and development, which was stimulated by settlement of the rich farmlands in the Midwest, the need for good transportation to market the farm products, the discovery of gold in California, and strategic military requirements of the Civil War. This in turn was reflected in the accelerated production of maps, most of which were reproduced by lithographic printing techniques. Toward the end of the period, map printing benefited further from the introduction of the rotary steam press, perfecting of zinc plates used on the rotary press, invention of cheap paper, and development of chromolithography, which eliminated tedious and costly handcoloring.

Most railroad maps were published by the well-established map companies, with the Colton firm contributing as many as 30 percent during these years. Colton maps, intended for general use, were of particularly high quality. Also published were maps of the various railroad surveys, including those of small lines in the East as well as the more extensive western systems. Some of the surveys were conducted by the railroad companies and others by official U.S. surveying parties. The latter were, in some instances, issued with congressional reports, although they were lithographically printed in private shops. Among the lithographers who printed railroad maps were the previously noted firms of A. Hoen of Baltimore, and P. S. Duval, Frederick Bourquin, and Augustus Kollner of Philadelphia. Among New York City lithographers who printed railroad maps were Ackerman, Julius Bien, John Disturnel, and H. H. Lloyd. A number of maps were issued with railroad guides and journals, among them *American Rail Road & Steam Navigation Guide*, *Appleton's Railroad Guide*, *Doggett's Railroad Guide*, *Pathfinder Railway Guide*, *American Railroad Journal*, *American Railway Review*, and *Lloyd's American Railroad*.

The impact of railroads on American private cartography is evidenced by the fact that after 1850 or so all general maps showed railroads but omitted other roads. Not until the automobile became a significant means of transportation, in the second decade of the twentieth century, did maps showing roads become common again.

Geology and Mining Maps

Lithography permitted greater diversity in cartographic design, symbolism, and subject matter. The potential of the new procedures stimulated compilation and publication of special subject maps. Coincidentally, the demand for specialized maps increased in the mid-nineteenth century as a result of

William A. Jackson. Map of the mining district of California. New York, © 1851. (Item 79)

explorations in the West, discovery of gold in California, and accelerated mineral exploitation in the northeastern states. Also, during the thirties a number of states established topographical or geological surveys. The natural outcome of all these developments was the compilation and printing of a number of geological, mining, and other special subject maps in the two decades that preceded the Civil War. With some few exceptions they were lithographically reproduced.

The coal fields of Pennsylvania were among the early mining regions to be mapped. A most impressive example is the *Map of the First and Second Anthracite Coal Fields* by Samuel B. Fisher of Pottsville, Pennsylvania. The 109- by 215-centimeter map was lithographed in 1836 by J. F. and C. A. Watson in Philadelphia. Color was added by hand to mark completed railroads, proposed railroads, turnpikes, county roads, county borders, and township lines. P. S. Duval printed, in 1838 and 1839 respectively, a *Map of the Swatara Coal Field* by Henry K. Strong and a *Map of the Lykens Valley, Bear Valley, and the Swatara Coal Regions*, drawn by John Paul, Jr. Also printed by Duval was a large (71 by 178 centimeters) *Map of the Anthracite Regions of Pennsylvania* by W. F. Roberts, which was published in 1849. It was colored by hand.

A *Geological Map of the State of New York, by Legislative Authority*, was published by the state in 1842. It was engraved by Sherman and Smith and printed by S. C. Clark, both of New York City. The map and the several profiles are hand colored to identify different geological formations. Of a more limited area is the *Map of the Sterlin ig\ Property Located in the Townships of Monroe & Warwick, County of Orange, State of New York*, which illustrates a descriptive booklet and was printed by Phair and Company of New York City in 1856. Commercial publisher John Farmer of Detroit published, in 1854, a *Map of the States of Michigan and Wisconsin Embracing a Great Part of Iowa, Illinois, & Minnesota and the Whole Mineral Region with Charts of the Lakes*. Known and potential mineral-bearing regions and sev-

eral geological formations are identified with color.

Discovery of gold in California in 1848 predictably created a demand for mining maps of that territory. One of the earliest to focus on the gold region was William A. Jackson's *Map of the Mining District of California* which contains descriptions of a number of cities and a brief essay on "The Mines." A revised, much more ornate, edition of Jackson's map was published in 1851. Also inspired by the discovery of gold was J. H. Atwood's *Map of the United States, the British Provinces, Mexico &c Showing the Routes of the U.S. Mail Steam Packets to California* and *A Plan of the Gold Region*, which Colton published in 1849 with an accompanying booklet. In the same category is the *Map of the Emigrant Road from Independence, Mo. to St. Francisco, California* by T. H. Jefferson, published by the author in 1849. It includes four sectional maps and a descriptive booklet.

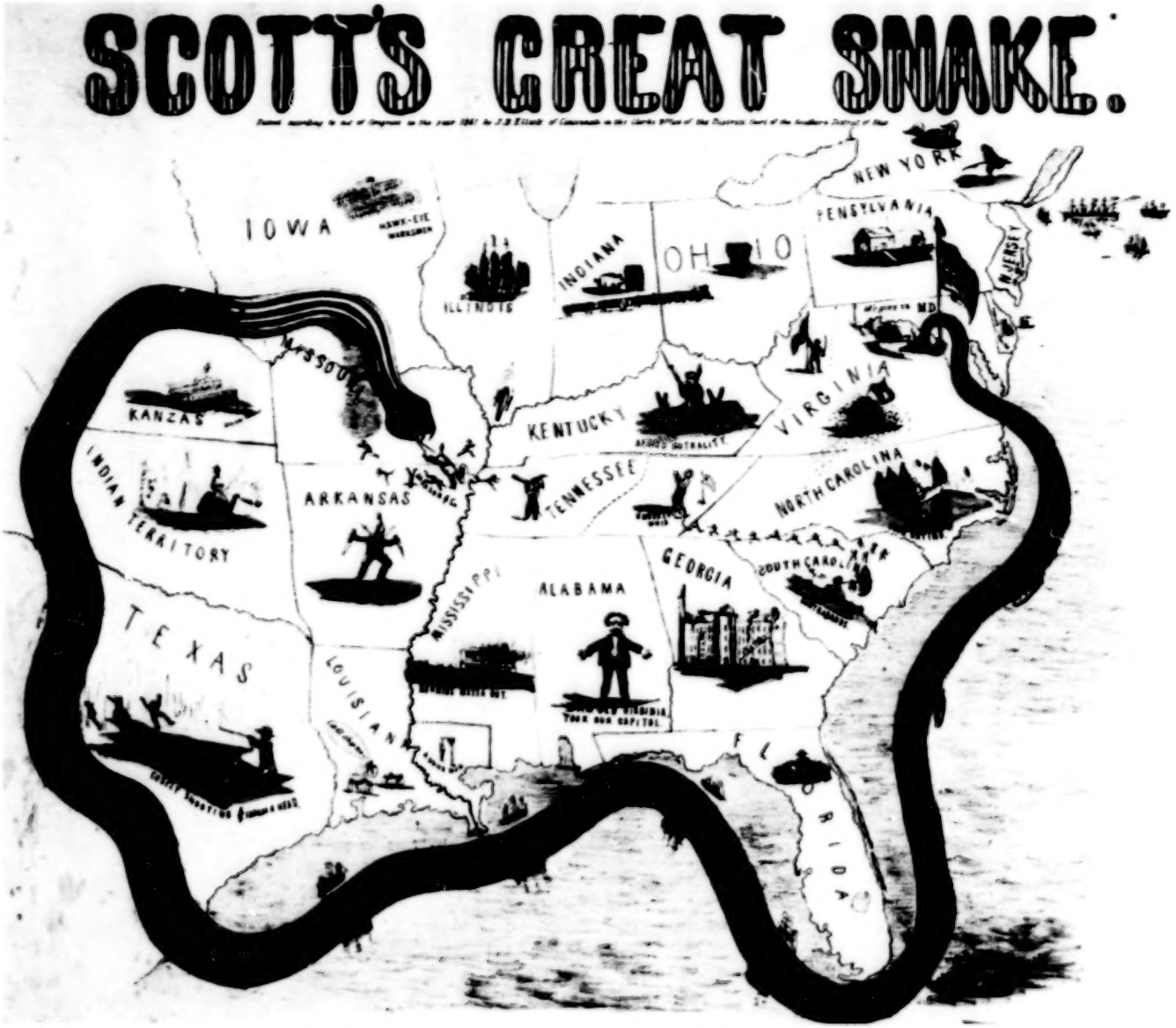
Only a few thematic maps, other than those featuring geology and mines, were published in the pre-Civil War years. Politics was one subject which was cartographically portrayed. Representative of this type is the *National Political Map of the United States*, which was published in 1856 by A. Ranney of New York and Chicago. It has portraits of the presidential and vice-presidential candidates, as well as the platforms of the three opposing political parties. A *Political Map of the United States Designed to Exhibit the Comparative Area of the Free and Slave States* was published in 1856 by William C. Reynolds of Chicago.

The Civil War and Private Cartography

The Civil War had a disturbing effect on most private cartographic establishments. Surveyors and cartographers were urgently needed for military mapping, and the staffs of the nonofficial publishers constituted the best reservoir for such specialists. Military requirements for such essentials as paper, cotton fabric, boards, and glue created commercial shortages of such materials. The demand for most local maps, particularly those of counties and cities, declined, and since such detailed maps were deemed to be of value to the enemy, they were withheld from sale. Conversely, official mapping and demands for military maps increased greatly during the war, and cartographic technology profited from this experience.

During the early years of the war, maps prepared by private publishers were generally updated versions of previously published works with forts and the locations of the opposing armies added, such as the map of the *Southern and Border States, Showing the Actual Positions of the National and Rebel Forces*, which was published by G. W. Colton in October of 1861. In the same category is the *New Military Map of the Border and Southern States*, published in 1861 by H. H. Lloyd and Company of New York. P. S. Duval and Son also lithographed general maps as well as some of more specific areas, such as Theodore Ditterline's *Field of Gettysburg, July 1st, 2nd & 3rd, 1863*. Other major lithographic firms that printed Civil War maps, including some official ones, were John Disturnell and Julius Bien of New York and Bowen and Company of Philadelphia. Bien, a native of Germany, set up a lithographic press in New York in 1849 and printed and published numerous maps and several atlases during the last half of the nineteenth century.

Colton also issued maps of more localized regions such as the 1861 *Topographical Map of North and South Carolina. A Large Portion of Georgia & Part of Adjoining States*. The panoramic, or bird's-eye view, map was a popular Civil War format, as illustrated by *Panorama of the Seat of War, Birdseye View of Virginia, Maryland, Delaware and the District of Columbia*, lithographed by John Bachmann and published in 1861. The cartoon map, a propaganda device, was also a Civil War cartographic innovation. On J. B. Elliot's *Scott's Great Snake*, for example, a large snake encircles the southern states to dramatize Gen. Winfield Scott's strategic plan to place an economic blockade around the Confederacy.



J. B. Elliott. Scott's great snake. Cincinnati, © 1861. (Item 83)

Post-Civil War Map Production, ca. 1865–1900

The Civil War had a restraining effect on railroad construction and business as well as on private mapmaking. Agriculture, however, flourished in response to wartime demands for food, particularly in the midwestern states. Economic recovery was rapid in the northern states, and a period of agricultural prosperity followed. The revival of railroad building, particularly in the trans-Mississippi region, sparked further economic growth and settlement. The Homestead Act, enacted in 1862, offered additional stimulus, as did the immigration of large numbers of Germans and Scandinavians in the sixties and seventies. The end of the war also encouraged renewed migration to California, Texas, and other western areas.

Improvements in map reproduction techniques, some developed during the war, accelerated map publishing in the postwar period. Initially, most reproduction procedures were only modifications or improvements on lithography and included the replacement of heavy, fragile stones by lightweight metal plates which could be curved to fit the drums of the rotary steam presses that came into use just before the war and which were used in most of the larger printing shops after 1865. Chromolithography became more common, thereby eliminating the need to hand color maps.

Of more far-reaching significance was the application of photography to lithography. Wartime demands led to some military uses of photoreproduction which were later adapted to private cartography. Full development of photography for map reproduction, however, did not come until the last decade or two of the nineteenth century. The most serious deterrent was inadequate indoor lighting. Although some shops had sun or light provided by rooms with glass roofs, dependence on natural light and sunny days complicated the application of photography to lithographic platemaking. Not until after 1880, when the carbon arc light was developed and electric lighting was perfected, did photography realize its full contribution to cartographic production.

After 1870, however, the wax-engraving, or cerographic technique, invented by Samuel Morse some four decades earlier was adapted in combination with electrotyping for quantity reproduction of maps, particularly atlases. During the quarter century immediately succeeding the Civil War, lithography, with the refinements noted, continued to be the principal method of reproducing maps.

General Maps and Atlases

The major prewar publishers of general maps and atlases accelerated their activities after 1865. The Colton Company continued publishing its series of atlases and maps into the late 1800s. Similarly, S. A. Mitchell's name appeared on atlases as late as the early 1890s, well after Mitchell's death. Several new atlas publishers appeared on the scene in the 1870s, among them Gaylord Watson, H. H. Lloyd, Ormando Gray, Asher and Adams, George F. Cram, and, in 1872, Rand McNally and Company.

Greater interest in cultural and intellectual values and

the expansion of the public school system were evidenced by the increase in the number of general and school wall maps published after 1870, particularly of the world, North America, and the United States. Some of the school map series featured the names of distinguished educators or scientists, e.g., Matthew Fontaine Maury, Monteith, and C. W. Bacon. Certain school map publishers seem to have had their maps reproduced by major lithographic printing houses. The nation's centennial, in 1876, provided a slight stimulus to the publication of maps of the United States, some of which included portraits of the founding fathers or illustrations of pavilions at the Philadelphia Exposition.

County Maps and Atlases

County map surveying and publishing revived after 1865 but with a shift in major areas of production and changes in techniques, printers, and publishers. By the outbreak of the Civil War, maps had been published for most counties in the New England and middle Atlantic states by a few major producers with headquarters in Boston, New York, and Philadelphia. During the late fifties representatives from these eastern firms and a few midwestern mappers prepared surveys for a number of counties in Ohio, southern Michigan, Indiana, and Illinois. Because federal surveyors had mapped large segments of the midwestern states by 1860, map producers drew heavily upon these official surveys in compiling county maps. The usual procedure was to copy the outline of the public land surveys from the General Land Office original, to which were added roads, buildings, farmsteads, and other significant features, based on a wheel or odometer traverse.

This practice was resumed by the county map producers following the war. Although some of the men involved had originally come from the East, at this time most of them resided in the western states. In contrast with the general practice in the East of selling maps after publication, most of the postwar midwestern county maps were sold on subscription. Individual agents, or several working as a team, secured subscriptions before preparing the maps. The practice of including illustrations became a profitable sideline. Merchants or farmers could, for set fees, have a reproduction of their homes or places of business printed in the margin of the map. There was also less dependence on eastern printers and lithographers after the Civil War, as competent firms became established in Cincinnati, Milwaukee, St. Louis, Chicago, and other midwestern cities.

The more prosperous counties in the Ohio Valley and Great Lakes states were mapped by 1880, after which the mapmakers moved beyond the Mississippi and, in some instances, to the Pacific coast. Because of the depressed economic conditions in the southern states, maps of only a sprinkling of counties in that region were published. With the affluent northeastern and midwestern counties mapped, mapmakers looked for new and more profitable fields to cultivate, such as printing maps on small sheets and bound between covers as atlases. Thus county atlases could be prepared from maps which had previously been published. These county atlases proved to be a real boon to private cartographic publishing for half a century or more.

County atlas publishing progressed slowly and uncertainly during the Civil War. As with county maps, the initiative in atlas production was taken by the eastern publishers. The earliest county atlas on record is the *Map of Berks County Pennsylvania from Actual Surveys by L. Fagan*, which was published at Philadelphia by H. F. Bridgens in 1861. This is actually just a segmented and bound version of Fagan's wall map which was published the previous year. An edition published in 1862 in a more orthodox atlas format is titled *Township Map of Berks County Pennsylvania*. It includes forty-one township maps, plans of seven cities or towns, a map of the county, a list of post offices, and statistical and distance tables. In 1864 Bridgens published an atlas of Lancaster County, Pennsylvania, and atlases of the New York counties of

Jefferson and St. Lawrence were published by S. N. and D. G. Beers, respectively, in 1864 and 1865. F. W. Beers, another member of this productive family, was responsible for an 1865 atlas of Erie County, Pennsylvania.

The tempo of county atlas publishing increased in 1866 with New York State being the principal theater of activity, and with S. N. and D. G. Beers continuing as the primary producers. F. W. Beers had expanded his interests and published atlases of Delaware and Muskigum counties in Ohio. Similar patterns prevailed in 1867, 1868, and 1869, when F. W. Beers collaborated with Ellis and Soule on some projects. Several other individuals had become involved in a minor way, including such ephemeral operators as L. G. Bennett, who produced atlases of several Minnesota counties in 1867.

Pre-1870 atlases, the majority of which carry Beers imprints, have ornate title pages, indexes, historical sketches, distance tables, double-page maps of the state, township maps (some with inset town or village plans), folded plans of large cities, and four or more plates of lithographic illustrations. The latter portray public buildings, churches, schools, some large residences, and prize livestock. Township and city plans give names of property owners. Lithography and printing were contracted to one of the large firms in Philadelphia or New York.

In 1870 several new publishers entered the county atlas field and raised it to new levels of productivity during the next decade. Three of the individuals, M. H. Thompson, Louis H. Everts, and Alfred T. Andreas had been army associates during the Civil War. Thompson, of Geneva, Illinois, published maps of several of that state's counties before entering military service. He reactivated his business in 1865 in association with Everts and later Andreas. D. J. Lake, who had been publishing county maps, principally in Ohio, also entered atlas publishing in 1870. Warner and Higgins was another partnership name that appeared on county atlases in that year. All the above centered their activities in the Midwest. The Beerses continued to work primarily in New York, New Jersey, Pennsylvania, and New England, although one also collaborated with Warner and Higgins on several midwestern projects.

In 1870 Andreas formed a partnership with his father-in-law, John M. Lyter, and published an atlas of Knox County, Illinois. The partnership continued until 1873, after which Andreas issued atlases of Illinois and Iowa counties independently. D. J. Lake, who operated originally in Ohio, later extended his activities into Michigan and Indiana. Thompson remained active for only two or three years, but Everts, alone and with various partners, continued to publish atlases in Ohio, Pennsylvania, New York, New Jersey, Wisconsin, and Maine up to 1875. In 1872 Everts relocated his headquarters in Philadelphia where, after 1876, he specialized in publishing county histories and biographies. Wesley R. Brink entered the field in 1873 and during the next decade or so published some forty county atlases, principally in Illinois and Missouri.

During the twenty-five years from 1865 to 1890, an estimated 750 county atlases were published, with peak production occurring between 1872 and 1877. In 1875 alone, more than one hundred volumes were issued. Most of those published for midwestern counties were copiously illustrated with sketches of public buildings, churches, farmsteads, residences, industrial plants, prize livestock, and portraits of farmers and their wives and children.

Alfred Andreas is generally credited with having developed the illustrated county atlas to its maximum potential. A common procedure of the atlas producer was to visit the editor of the principal county newspaper, outline the plan for the proposed volume, and persuade him to publish articles about the atlas and its progress. Staff members would traverse the various roads in the county and fill in all pertinent information on a copy of the U.S. Land Office survey. Canvassers would then visit rural and town residences soliciting subscriptions for the atlas, which ranged in price from seven to ten dollars per copy. Artists also took orders to prepare drawings, for pre-

scribed fees, of farmsteads, rural residences, the farmer and his family, and perhaps blue ribbon livestock for inclusion in the atlas. Biographical sketches were also included in the volume, for an additional fee, of course. Lithographic illustrations in county atlases provide a documentary record of nineteenth-century midwestern America as well as delightful specimens of folk art. The county atlases are also essential references for studying the local history and genealogy of the latter half of the nineteenth century.

Lithographically illustrated county atlas publishing continued up to around 1890, by which time maps of all the more prosperous counties had been included in one or more atlases. The industry had weathered such crises as the panic of 1873 and the Chicago fire, which destroyed most of the printing and lithographic plants and publishing houses. Those publishers who shifted their attention from atlases to county histories and biographies prospered for an additional span of years.

By 1890 photography had been perfected, and photographs replaced the hand-drawn lithographic sketches that were reproduced in atlases published between 1865 and 1890. By using photography for illustrations and, quite probably, wax engraving for map reproduction, two new publishing firms, George A. Ogle and Company of Chicago and Northwest Publishing Company of Philadelphia, dominated county atlas publishing between 1892 and 1923. During those three decades, Ogle alone published almost six hundred county atlases. Some included maps of midwestern counties which had been published earlier, but Ogle also moved westward to include counties in the Dakotas, Oklahoma, Washington, and Oregon.

State Atlases

Atlases of the states of South Carolina, New York, and Maine were reproduced from engraved copperplates before 1830. Almost four decades passed before atlases of other states were published. Between 1866 and 1890, however, some forty were produced, several in multiple editions. Most were prepared by individuals who had previously been engaged in compiling county maps and atlases. Eastern publishers were also the first to focus on state atlases. The earliest on record is Simon J. Martenet's *Map of Maryland, Atlas Edition*, which was published in Baltimore ca. 1866. It was based on the official map of Maryland which was compiled under Martenet's direction and published by the state in 1865.

Daniel G. Beers, an early producer of county atlases, published state volumes for Delaware (1868) and Rhode Island (1870), and Frederick W. Beers issued an atlas of New Jersey in 1872. Henry F. Walling sought to reestablish his map publishing business after the Civil War, but was unwilling or unable to compete with the more aggressive midwestern producers. Accordingly, he shifted to compiling and publishing state atlases for which he drew upon his large personal collection of town and county maps. Individually and in partnerships with Simon Martenet, Ormando W. Gray, and others, Walling published atlases of Ohio, New York, Illinois, Massachusetts, Pennsylvania, Michigan, Maryland, and Wisconsin between 1868 and 1876. None includes illustrations. All, however, have descriptive sections on history, topography, botany, and geology; and some list information sources used for compilation. Each also has comprehensive business directories for the principal cities. Firms probably paid a moderate fee to have their names listed or at least subscribed to the atlas.

In 1873 Alfred T. Andreas moved his headquarters from Davenport, Iowa, to Chicago, where he expanded activities to include state atlases. Minnesota was selected for his first effort. It was a daring choice, for Minnesota had entered the Union only fifteen years before, and maps or atlases had been published for only a few counties. Andreas reasoned that this was an asset because his agents would be soliciting subscriptions in virgin territory at fifteen dollars per atlas. Work began on the atlas in 1873, with Andreas directing activities from his Chicago

headquarters. At the peak of operations, more than sixty Andreas men were working in the state. The scope of the project is summarized in the *Atlas* under the heading, "What it Takes to Make a State Atlas." It notes that lithography, printing, typesetting, coloring, and binding were all done by firms "located in the Lakeside Building, which was erected especially for the publishing business, and particularly for the publishing of Atlases." The *Atlas* required seventy tons of paper and seventeen tons of cardboard, and the cost of printing exceeded $200,000. The panic of 1873 was a blow to Andreas, for many subscribers were unable to pay. Nonetheless, the *Atlas of Minnesota* was completed and began being distributed to subscribers in December 1874. Purchasers received a volume measuring 17.5 by 14 inches with just under four hundred pages. There are double-page maps of the state, the United States, and the world; five pages of statistical maps of Minnesota and the United States; and seventy pages of county maps and plans of towns and cities. The volume also includes more than one hundred pages of lithographic sketches, portraits, views, and landscapes. Geographical and historical text, statistical tables, and biographical data fill about another one hundred pages. A thirty-page list of "Patrons of the Minnesota State Atlas" completes the volume.

Before the Minnesota Atlas was off the press, Andreas's men were at work on an atlas of Iowa, which was published in 1875. Despite the continuing economic depression, more than twenty-two thousand copies of the *Illustrated Historical Atlas of Iowa* were sold. This was not enough, however, to pay all expenses, and Andreas was forced to reorganize his business under the name of Baskin, Forster and Company. The firm's next attempt was in Indiana, with the resulting atlas being released in 1876. Only twelve thousand subscriptions were secured and the project ended in disaster. Andreas was involved with one other state project, the *Historical Atlas of Dakota*, which was published in 1884. After 1880, however, Andreas was primarily engaged in compiling and publishing a series of histories, the most renowned of which is his three-volume *History of Chicago*, published from 1884 to 1886.

Real Estate and Insurance Maps and Atlases

Due to the many needs and uses for city and town plans, very early in our history urban mapping became an active and productive branch of cartography. The introduction and development of lithographic printing accelerated this trend both in the official and the private sectors. In the decade preceding the Civil War, maps of most of the larger eastern cities were issued by such publishers of town and county maps as Henry F. Walling and Robert P. Smith as well as by the commercial map firms of Colton and Mitchell. As aids for tax assessment and administration, official surveyors also prepared maps of the principal urban centers. Real estate firms also required urban plans to provide research sources for agents and locate and promote sale properties. For the former purpose, large-scale plans showing block and lot numbers were published for New York and other major cities early in the 1850s. Full development of this type of plan was delayed because of the war.

The resurgence of private cartography and the introduction of the atlas format around 1865 were also reflected in urban maps and mapping. Matthew Dripps, who had prepared maps of several boroughs in the fifties, published real estate atlases of New York City in 1867 and of Brooklyn in 1869. Frederick W. Beers, a prolific producer of county atlases, also published an *Atlas of New York and Vicinity* in 1867. George W. Bromley entered the real estate atlas field around 1879 and continued well into the twentieth century with some interruptions and name changes. Principal cities covered by Bromley were New York, Boston, Philadelphia, and Baltimore.

Between 1871 and 1900, Griffing M. Hopkins of Philadelphia, also important in county atlas production, published real estate atlases for Philadelphia, Baltimore, Washington, D.C., St. Paul, Minneapolis, Atlanta, and a number of other eastern, southern, and midwestern cities. The G. M. Hopkins Company of Philadelphia is still active in publishing real estate atlases. Between 1880 and 1896, Roger H. Pidgeon and Elisha Robinson, independently and in partnership, published atlases of New York City, New Orleans, Detroit, Chicago, Bridgeport, Connecticut, and Essex, New Jersey, among others.

Real estate atlases generally give block and lot numbers by means of which the property owners can be identified in official city record books. The construction material used for individual buildings, street names and dimensions, and the location of fire hydrants and underground utilities are also shown in most real estate atlases. William Perris issued large-scale plats of sections of New York City in 1852 in response to requests from major fire insurance companies and underwriters. During the next six or seven years, Perris published a series of atlases under the general title *Maps of the City of New York Surveyed Under the Direction of Insurance Companies of Said City*. Revised editions were published by Perris, and Perris and Browne up to 1889.

The apparent success of these atlases, which included even greater detail and more specific information which was of interest to fire insurance companies than real estate atlases contained, induced other individuals and firms to enter the field. Around 1867, the D. A. Sanborn National Insurance Bureau was established in New York City. It continues in business today in Pelham, New York, as the Sanborn Map Company. Between 1867 and 1960, Sanborn published large-scale insurance maps and atlases in multiple editions for some twelve thousand U.S. towns and cities. Through a paste-on service, Sanborn representatives updated and corrected the volumes on the subscribers' premises. In the closing decades of the nineteenth century, a number of publishers produced insurance atlases for a limited number of cities. Most of these firms eventually were acquired by Sanborn Company, which monopolized the insurance map and atlas business after 1915.

Panoramic Maps of American Cities

A distinctly American and tremendously productive phase of urban mapping was the publication of the panoramic map or bird's-eye view. The town or city was drawn in perspective as if viewed from an elevation of 2,000 or 3,000 feet. The street pattern was laid out in perspective on the drawing sheet. Based on personal observation and traverse, the artist would sketch in the physical and cultural features to create a strikingly detailed and comprehensive landscape.

The panoramic map, like many other products of nineteenth-century cartography, was a child of lithography and very likely was patterned after the views and prints of cities and landscapes which became popular in the several pre-Civil War decades. Like county and state atlas publishing, panoramic map production did not blossom until a decade or so after the Civil War; and its centers of activity were located, similarly, in the more prosperous states, i.e., New England, the middle Atlantic region, and the Midwest. The panoramic map period extended from around 1870 to about 1920, during which time an estimated twenty-five hundred towns and cities were mapped. This is particularly amazing because scarcely more than two dozen artists contributed, and the majority of the maps were prepared by half this number. Among the more productive workers were Thaddeus M. Fowler, Albert Ruger, Lucien R. Burleigh, and Oakley H. Bailey. Currier and Ives published panoramic maps of New York, Chicago, Boston, San Francisco, and Washington, D.C., in the seventies, eighties, and nineties.

Most panoramic maps were reproduced in lithographic printing plants in Chicago, Cincinnati, Madison, Milwaukee, and New York, although a number of other firms in

cities throughout the country were utilized. Several artists personally prepared stones, and a few operated their own lithographic printing plants. Maps issued in colored editions (the majority were) required separate stones and successive press runs for each color (usually not more than three). In most instances, the artists personally solicited subscriptions for the maps, often aided by favorable articles in local newspapers. Prices seem to have ranged from one to ten dollars per map, depending on the size, coloring, and the number of copies printed, which varied from several hundred, for smaller towns, to as many as five thousand or more for large cities. The panoramic plans, as well as the county, city, and state land ownership maps and atlases, comprise unexcelled records of nineteenth-century American history for those sections of the country fortunate enough to have been so mapped.

Thematic Maps

The last half of the nineteenth century witnessed an increase in the publication of thematic or special subject maps. This was in response to the greater flexibility of lithography and of wax engraving, which became a major map reproduction process after 1870. It also reflected the expansion and growth of the country, greater awareness of social, political, and economic problems and conditions, and further developments and changes brought about by the industrial revolution. Politics and religion were volatile interests which were evidenced in such publications as *Lambert's Illustrated Ecclesiastical Map of the United States and a Portion of British America*, published in 1885 by Ecclesiastical Map Publishing Company of New York; Emil Maklo's 1877 to 1879 *Political Map of the United States Showing Congressional Districts and Geographical Distribution of Political Parties*; and a map titled *How the Public Domain Has Been Squandered*, published by Rand McNally and Company for the Democratic Party Platform Committee in 1884. Fletcher W. Hewes prepared a *Citizen's Atlas of American Politics 1789–1892*, which was published by C. Scribner's Sons of New York.

Expansion of the telegraph network throughout the country inspired telecommunication maps and stimulated development of weather forecasting and climatic studies, with resulting maps featuring these specializations. The increased importance of statistical studies and, more specifically, publication by the U.S. Census Office, in 1874, of Francis A. Walker's *Statistical Atlas of the United States Based on the Results of the Ninth Census 1870* stimulated compilation of distributional maps of various types. Although it was an official Census Office publication, Walker's *Atlas* was lithographically printed by a private firm, Julius Bien of New York City.

Similarly, publication of climatic and crop production maps and atlases by the U.S. Department of Agriculture prompted compilation and publication of maps on these subjects by individuals and private firms. Some agriculture or crop maps were issued by commerical establishments to promote sales of agricultural machinery and equipment and other farm supplies.

History was another subject that invited map publications, particularly during the nation's centennial in 1876. The Spanish-American War, at the close of this momentous century, likewise encouraged publication of a number of maps and atlases such as LeRoy Armstrong's *Pictorial Atlas Illustrating the Spanish-American War*, published in Washington, D.C., by R. A. Dinsmore, and A. C. Shewey's *Spanish American War Atlas*, both of which are dated 1898.

Wax Engraving

The Colton firm continued to issue general and special maps and atlases, including railroad maps, into the late 1880s. Its dominance in commercial map publishing was challenged by a new company which was to become, during the next century,

America's largest and most prestigious cartographic publisher. The foundations of the new firm, Rand McNally and Company, rested firmly on the railroad industry. In 1856 William H. Rand opened a small, second-floor printing shop in Chicago. Andrew McNally, a young Irish immigrant printer, was employed by Rand in 1858. Eight years later the partnership of the two men was formalized, and Rand McNally and Company was established. The company's principal customers after 1868, as well as before, were railroad companies, for whom they printed reports, timetables, posters, coupons, and tickets. In 1871 Rand McNally and Company introduced the *Western Railway Guide—The Traveler's Handbook to All Western Railway and Steamboat Lines*. The title was subsequently changed to *Railway Guide*.

Along with many other business establishments, Rand McNally was burned out in the Chicago fire of October 1871. By extraordinary effort the company was again operational within three days at a new location. The December 1872 issue of the *Railway Guide* contained such maps as *Boston and Vicinity* and *Baltimore and Washington*, and soon Rand McNally and Company was deeply involved in map and atlas publishing, utilizing the wax-engraving reproduction process.

This process, identified as cerography, was invented some forty years earlier by Sidney E. Morse, who published several cerographic atlases and a number of maps in the mid-1840s. It was revived or rediscovered in the 1850s or 1860s. Wax engraving included several operations. The manuscript map prepared by the cartographer was photographed on or transferred to a copperplate, which was then covered with a thin layer of wax. Utilizing various instruments and tools, the engraver traced over the lines on the map removing the wax down to the copperplate. Names were impressed through the wax with printer's type set into a holder. Next the plate was built up by adding more wax between the lines to insure greater depth for the printing plate. From this original plate, called a "black plate," the engraver made a printed impression on paper. While the ink was still fresh he pressed the paper against a metal plate, securing an offset. A separate offset was made for each color plate required for printing the map, and the parts to be colored were outlined with the graver. The color plate was then passed under a machine that cut a fine ruled tint on it. When all the color blocks were ready they were electrotyped, and electrotype plates were turned over to the printer. To strengthen and thicken the plates, for greater durability, they were backed with metal. They were then placed on the press through which the map passed, once for each color that it was to receive.

Maps reproduced by wax engraving could be sold for much less than those printed by lithography, and the process also permitted more frequent updating and revising. The new technique permitted Rand McNally and other map publishers who employed wax engraving to take over the commercial map publishing field from such older firms as Colton.

In 1875 Rand McNally issued the first of its series of pocket maps and guides, which sold for fifty cents to one dollar each. For the centennial year the company published a large 58- by 100-inch wall map of the United States. Later that year the first edition of Rand McNally and Company's *Business Atlas* appeared, the forerunner of the *Commerical Atlas and Marketing Guide*, which has been published in annual editions for more than a century. This paved the way for other atlases of the world and the United States in many formats and price ranges, including some for use in schools. Rand McNally also published school wall maps. Railroad maps and guides, however, continued to be one of its largest cartographic fields until the end of the century.

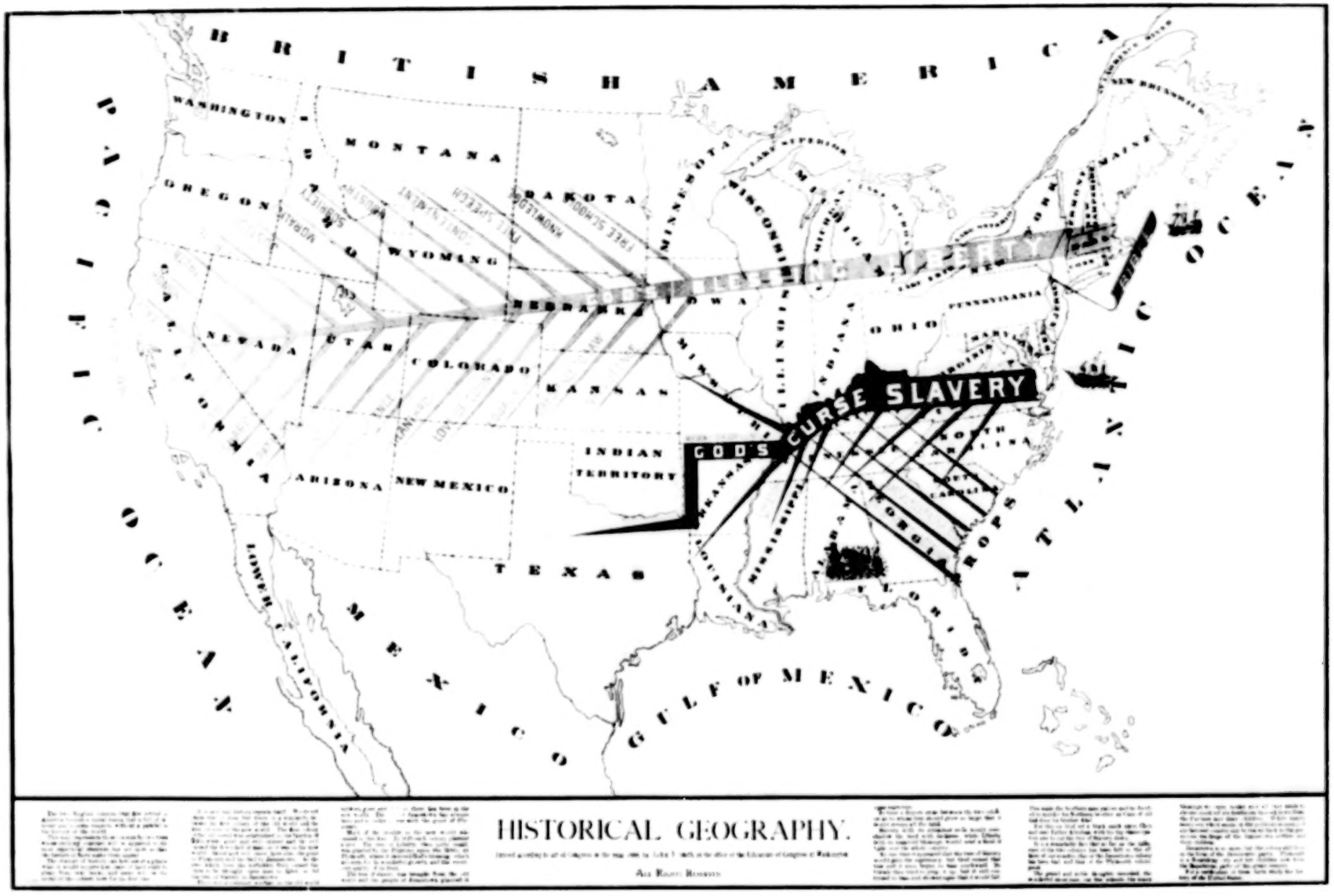
Another commercial map publishing company of the late nineteenth century that continues in business today is the George F. Cram Company of Chicago. Cram can trace its origins back to about 1867 and has some tenuous connection with Sidney E. Morse. Like Rand McNally, the success of the Cram Company in the late nineteenth and early twentieth centuries was built upon the wax engraving process. Railroad maps were also one

of its principal products before 1900, but in 1892 the company did publish an *Atlas of Cuyahoga County and Cleveland, Ohio*, and introduced in 1892 the *Standard American Railway System Atlas of the World*, which went through a number of editions up to 1909.

Bicycle Maps and Guides

With the extension of the railroad system to the scenic West, the concept of travelling for pleasure gained new significance. Another dimension was added to recreational transportation after 1880 with the invention and improvement of the new "safety" bicycle. The growing popularity of cycling for sport, principally among wealthy young men and women in the eastern urban areas, led to demands for cycling maps and guides. The League of American Wheelmen, organized in 1880, pioneered in such publications. After 1890, however, several commercial map publishers also sought to meet the demand. *The Cyclist's Road Book of New Jersey*, published in 1890 by Henry A. Benedict, was an early example. Rand McNally and Company also published cycling maps and guides between 1894 and 1905.

Meanwhile, on November 2, 1895, an automobile race between a Mueller-Benz and a Duryea, was held in Chicago over a ninety-two-mile course from Jackson Park to Waukegan. The Mueller-Benz came to grief in a ditch in a futile attempt to dodge a wagon and team of horses. The Duryea, driven by J. Frank Duryea, successfully completed the course. An account of the race in the *Chicago Times-Herald* was illustrated with a map. This was reprinted in the initial number of the *Horseless Age* magazine, published in December 1895. It is generally believed to be the first automobile road map published in the United States. From this inauspicious beginning, at the close of the nineteenth century, automobile road map publishing expanded with the growth in numbers of the motor car and the expansion of the highway network. In the twentieth century road maps totally displaced railroad maps and became one of the principal products of American commercial map publishing.



John F. Smith. Historical geography. Chicago, 1888. (Item 108)

Selected Readings

Christopher Colles. A Survey of the Roads of the United States of America, 1789. Edited by Walter W. Ristow (Cambridge: Belknap Press of Harvard University Press, 1961), 227 pp., illus., maps. (The John Harvard library)
"Bibliography of Christopher Colles": p. 107.
Bibliography: pp. 109–14.

John R. Hébert, comp. Panoramic Maps of Anglo-American Cities: A Checklist of Maps in the Collections of the Library of Congress, Geography and Map Division. Compiled by John R. Hébert (Washington: Library of Congress, 1974), v, 118 pp., illus.
Includes bibliographical references.
Introductory essay, pp. 3–11.

Louis C. Karpinski. Bibliography of the Printed Maps of Michigan, 1804–1880, with a Series of Over One Hundred Reproductions of Maps Constituting an Historical Atlas of the Great Lakes and Michigan (Lansing: Michigan Historical Commission, 1931), 539 pp., maps.

Andrew M. Modelski, comp. Railroad Maps of the United States: A Selective Annotated Bibliography of Original 19th-century Maps in the Geography and Map Division of the Library of Congress. Compiled by Andrew M. Modelski (Washington: Library of Congress, 1975), v, 112 pp., maps.
Introductory essay: pp. 1–14.

John William Reps. The Making of Urban America: A History of City Planning in the United States (Princeton: Princeton University Press, 1965), 574 pp., illus., maps.
Bibliography: pp. 545–62.

Walter William Ristow, comp. A la Carte: Selected Papers on Maps and Atlases. Compiled by Walter W. Ristow (Washington: Library of Congress, 1972), x, 232 pp. illus.
Most of the papers originally appeared in the *Quarterly Journal of the Library of Congress*.
Includes bibliographical references.

Walter William Ristow, comp. Guide to the History of Cartography: An Annotated List of References on the History of Maps and Mapmaking. Compiled by Walter W. Ristow (Washington: Library of Congress, 1973), 96 pp., 24 cm.

John Parr Snyder. The Mapping of New Jersey: The Men and the Art [by] John P. Snyder (New Brunswick, N.J.: Rutgers University Press [1973]), xiv, 234 pp., illus.
Bibliography: pp. 215–19.

Richard W. Stephenson, comp. Land Ownership Maps, a Checklist of Nineteenth Century United States County Maps in the Library of Congress. Compiled by Richard W. Stephenson (Washington: Library of Congress, 1967), 86 pp., illus., maps.
Introductory essay, pp. vii–xxv.

Edmund B. Thompson. Maps of Connecticut before the year 1800: A Descriptive List (Windham, Conn.: Hawthorn House, 1940), 66 pp., maps.

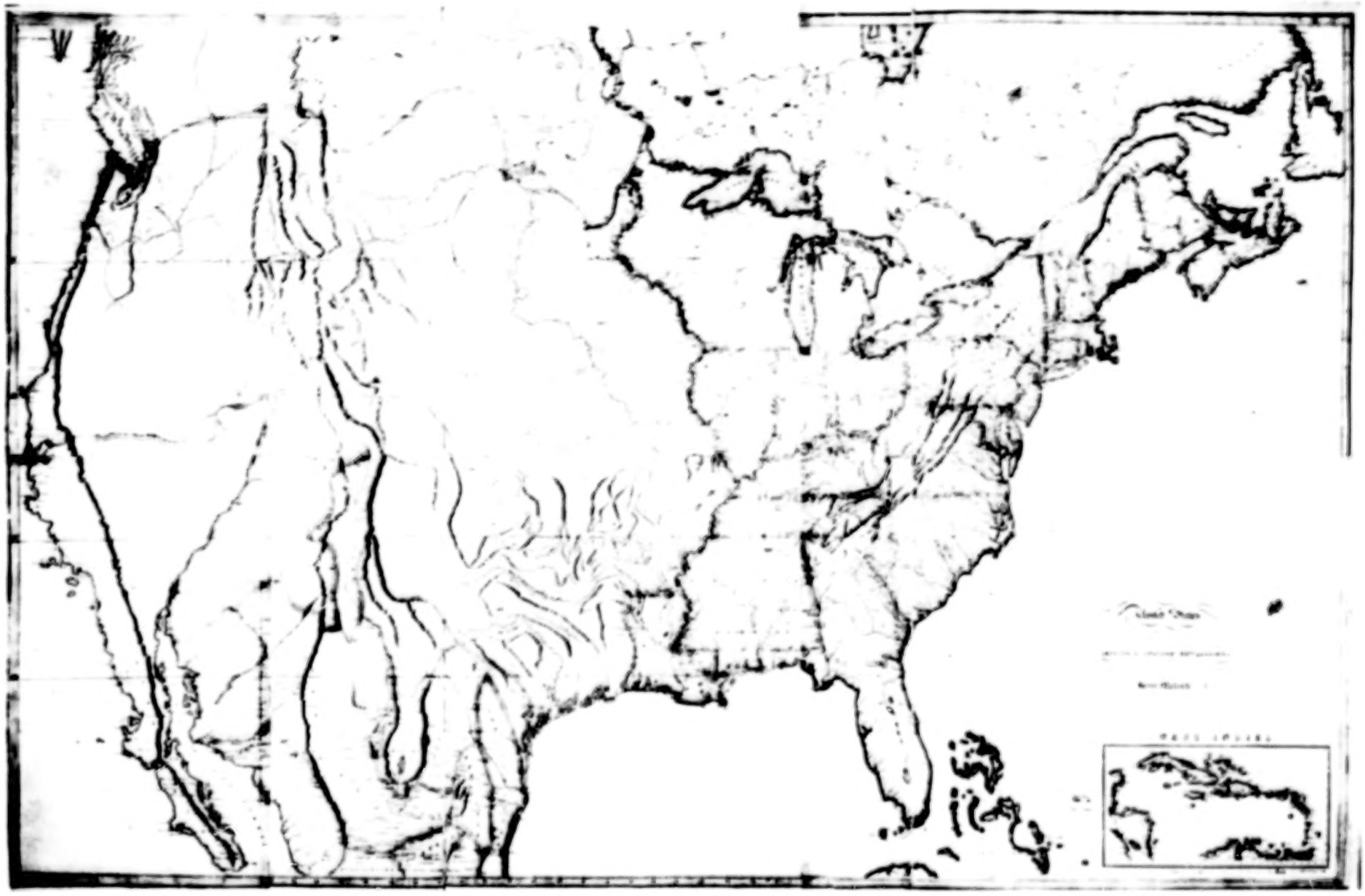
Edmund B. Thompson. Maps of Connecticut for the Years of Industrial Revolution, 1801–1860, a Descriptive List (Windham, Conn.: Hawthorn House, 1942), 111 pp., maps.

Norman J. W. Thrower. Maps and Man, an Examination of Cartography in Relation to Culture and Civilization (Englewood Cliffs, N.J.: Prentice-Hall, 1972), 184 pp., illus.

Carl I. Wheat. Mapping the Transmississippi West, 1540–1880 (San Francisco: Institute of Historical Cartography, 1957–60), 5 vols., maps.
Contents:—vol. 1. The Spanish entrada to the Louisiana Purchase, 1540–1804, 264 pp.—vol. 2. From Lewis and Clark to Frémont, 1804–1845, 281 pp.—vol. 3. From the Mexican War to the boundary surveys, 1846–1854, 349 pp.—vol. 4. From the Pacific Railroad surveys to the onset of the Civil War, 1855–1860, 260 pp.—vol. 5 (2 parts). From the Civil War to the Geological Survey [1861–ca. 1880], 487 pp.

David Woodward. The All-American Map: Wax Engraving and Its Influence on Cartography (Chicago, London: The University of Chicago Press [© 1977]), 168 pp., 23 cm.
Bibliography: pp. 149–61.
"Published for the Hermon Dunlap Smith Center for the History of Cartography at the Newberry Library."

David Woodward, ed. Five Centuries of Map Printing. Edited by David Woodward (Chicago: University of Chicago Press, 1975), xi, 177 pp., illus.—(The Kenneth Nebenzahl, Jr., lectures in the history of cartography at the Newberry Library)
"Published for the Hermon Dunlap Smith Center for the History of Cartography, the Newberry Library."
Bibliography: pp. [167]–70.



John Melish. Map of the United States with the contiguous British & Spanish possessions. Philadelphia, 1816. (Item 4)

Exhibit Items

The Engraving Period, ca. 1785–1830

Maps of the United States of America

1
Map of the United States, exhibiting the post-roads, the situations, connections & distances of the post-offices, stage roads, counties, ports of entry and delivery for foreign vessels, and the principal rivers. By Abraham Bradley junr. W. Harrison Junr. fc. W. Barker sculp., Philada. [2d ed., Philadelphia, 1796] Map 88 x 95 cm. Scale ca. 1: 2,400,000. (G3700 1796.B37)

2
The United States according to the definitive treaty of peace signed at Paris, Septr. 3d. 1783. By Wm. McMurray, late Asst. Geogr. to the U.S. R. Scot, Sculp. [n.p., 1784] Col. map 67 x 96 cm. Scale ca. 1:3,200,000. (G3700 1784.M2 Vault)
Force map collection no. 102.

3
A geographical description of the United States, with the contiguous British and Spanish possessions, intended as an accompaniment to Melish's map of these countries. Philadelphia, John Melish, 1816. 21 cm. (E165.M512 G&M RR)

4
Map of the United States with the contiguous British & Spanish possessions. [1st state. Philadelphia, John Melish, 1816] Col. map 88 x 141 cm. Scale ca. 1:3,900,000. (G3700 1816.M4)
Annotated in ink: "Entered according to Act of Congress this day of June 1816 as published by John Melish."
Incomplete proof copy.

5
Memoir on the recent surveys, observations, and internal improvements, in the United States, with brief notices of the new counties, towns, villages, canals, and rail roads, never before delineated. By H. S. Tanner. Intended to accompany his new map of the United States. Philadelphia, H. S. Tanner, 1829. 108, 8 p. 19 x 12 cm. (E165.T18 G&M RR)

6
United States of America: by H. S. Tanner, 1829. Philadelphia, Henry S. Tanner, 1829. Col. map 116 x 153 cm. on 2 sheets, each 116 x 77 cm. (G3700 1829.T3)

The descriptions of maps, atlases, and globes included in this checklist are verbatim. When a name or date is supplied, it appears in brackets with all uncertainties noted.

Early Road Maps and Guides

7
A survey of the roads of the United States of America, by Christopher Colles. C. Tiebout Sculpt. [New York] 1789. 23 cm. (G1201. P2C6 1789 Vault; Phillips 1326)

State Maps

8
An accurate map of the Commonwealth of Massachusetts exclusive of the District of Maine. Compiled pursuant to an Act of the General Court, from actual surveys of the several towns, &c. taken by their order, exhibiting the boundary lines of the Commonwealth, the counties and towns, the principal roads, rivers, mountains, mines, islands, rocks, shoals, channels, lakes, ponds, falls, mills, manufactures & public buildings, with the true latitudes & longitudes, &c. By Osgood Carleton. Boston, O. Carleton and I. Norman. [1799?] Col. map 89 x 119 cm. Scale ca. 1:253,440. (G&M Vault)

9
A map of Virginia, formed from actual surveys, and the latest as well as most accurate observations, by James Madison, D.D., President of Wm. & Mary College. Drawn by Wm. Davis. Engraved by Fred. Bossler, Richmd. [2d impression] Richmond, by the proprietors, 1807. Col. map 115 x 173 cm. in 2 parts, each 115 x 88 cm. Scale ca. 1:440,000. (G3880 1807 .M3a Vault copy 3)

10
Map of Alabama constructed from the surveys in the General Land Office, and other documents, by John Melish. Philadelphia. John Melish, 1820. Col. map 74 x 55 cm. Scale 1:950,400 (15 miles to an inch). (G&M Vault)

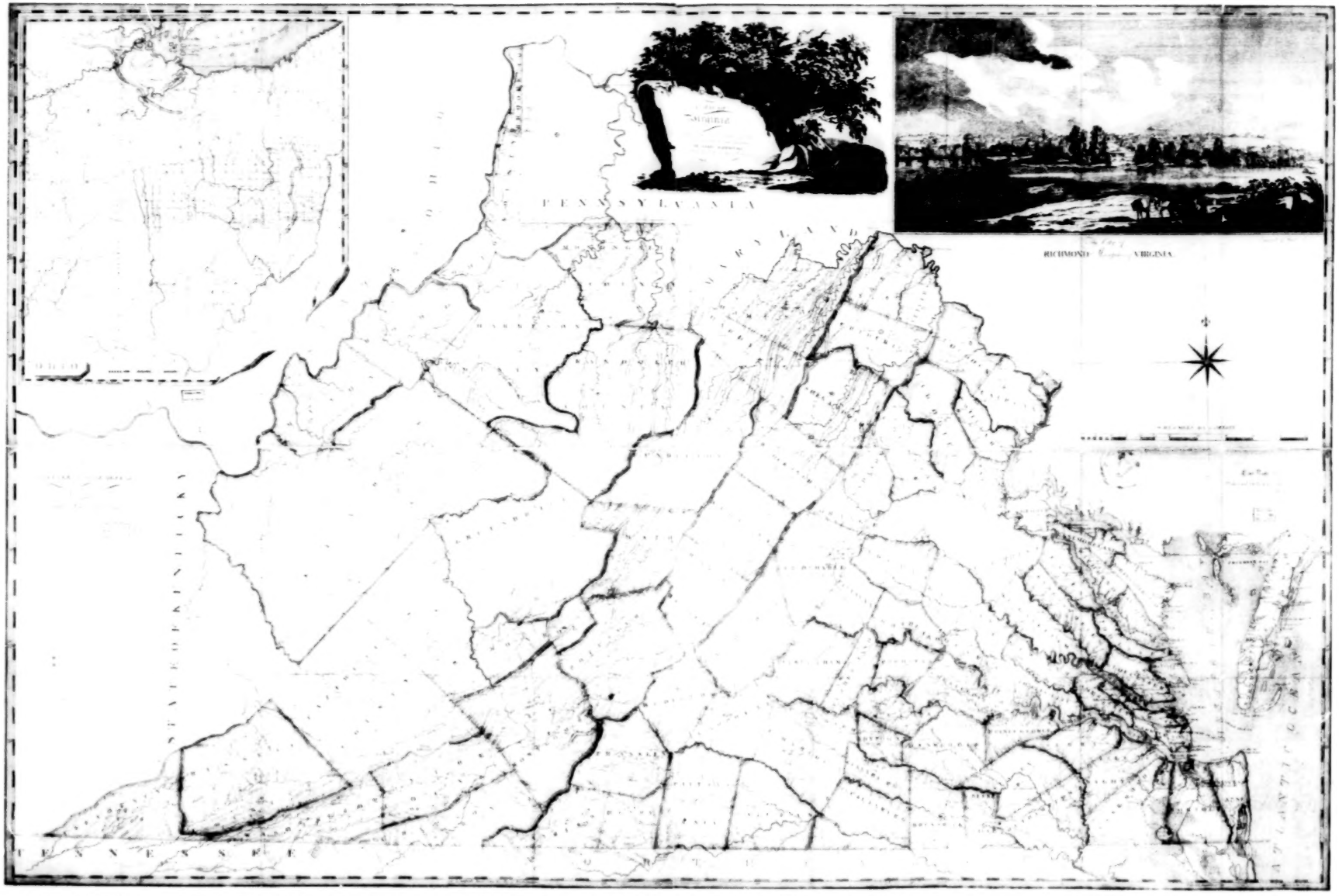
11
Map of Mississippi constructed from the surveys in the General Land Office and other documents, by John Melish. E. Gillingham, Fc. Philadelphia, John Melish, 1820. Col. map 68 x 47 cm. Scale 1:950,400 (15 miles to an inch). (G&M Vault)

12
A correct map of the State of Vermont from actual survey; exhibiting the county and town lines, rivers, lakes, ponds, mountains, meetinghouses, mills, public roads &c., by James Whitelaw Esqr. Surveyor General. Engraved by Amos Doolittle, New Haven, 1796. [n.p.] 1796. Col. map 114 x 77 cm. Scale ca. 1:253,440. (G&M Vault)

General and State Atlases

13
An illustrated atlas, geographical, statistical, and historical, of the United States, and the adjacent countries. By T. G. Bradford. Philadelphia, E. S. Grant, and Company [©1838] 49 cm. (G1200.B8 1838; Phillips 1381)

14
An atlas of the State of New York containing a map of the State and of the several counties. Projected and drawn by a uniform scale from documents deposited in the public offices of the State, and other original & authentic information under the superintendance & direction of Simeon DeWitt, Surveyor General, pursuant to an act of the legislature, and also the physical geography of the State & of the several counties & statistical tables of the same. By David H. Burr. New York, David H. Burr, 1829. (G1250.B8 1829; Phillips 2206)



James Madison. A map of Virginia, formed from actual surveys, and the latest as well as most accurate observations. Richmond, 1807. (Item 9)

15
Carey's American atlas: containing twenty maps and one chart. Philadelphia, Mathew Carey, 1795. 38 cm. (G1200.C2 1795 Vault; Phillips 1172, 1213, 1362)

16
A new general atlas, comprising a complete set of maps, representing the grand divisions of the globe, together with the several empires, kingdoms and states in the world; compiled from the best authorities, and corrected by the most recent discoveries. Philadelphia, Anthony Finley, 1829; 36 cm. (G1019.F45 1829; Phillips 752)

17
Atlas accompanying Greenleaf's map and statistical survey of Maine. Portland, Shirley & Hyde [1829] 36 cm. (G1215.G7 1829 Vault; Phillips 1772)

18
Map of the State of Maine with the Province of New Brunswick, by Moses Greenleaf. Engraved by J. H. Young & F. Dankworth, Philadelphia. Portland, Shirley & Hyde, 1829. Col. map 130 x 104 cm. in 4 parts, each 64 x 52 cm. Scale ca. 1:580,000 (G&M map coll.)

19
A survey of the State of Maine, in reference to its geographical features, statistics and political economy; illustrated by maps. By Moses Greenleaf. Portland, Shirley and Hyde, 1829. 22 cm. (F19.G81 G&M RR)

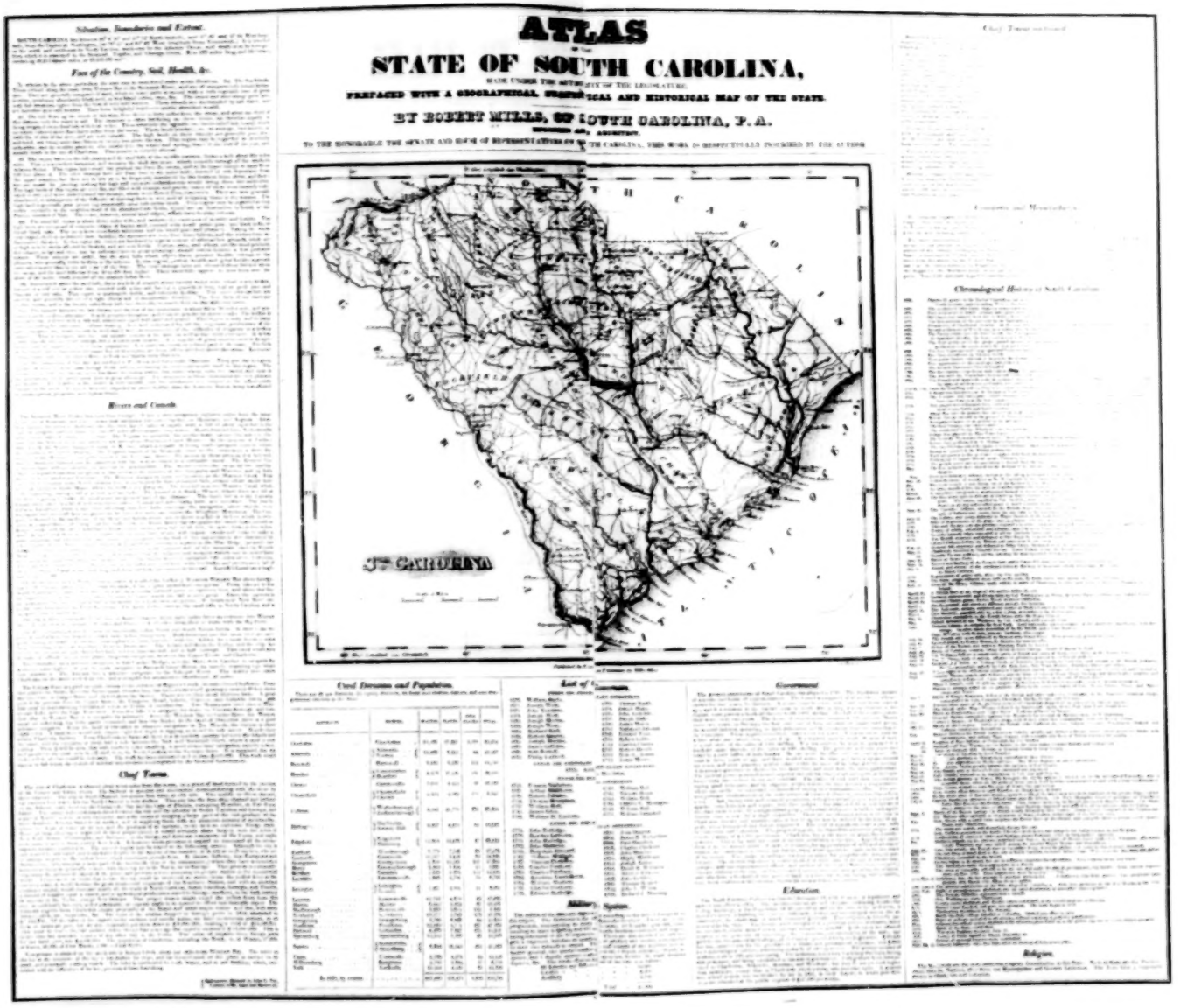
20
A general atlas containing distinct maps of all the known countries in the world. Constructed from the latest authority. Baltimore, Fielding Lucas, Jun. [© 1823] 39 cm. (G1019.L76 1823 Vault copy 2; Phillips 742)

21
A military and topographical atlas of the United States; including the British possessions & Florida . . . to which is added, a list of the military districts, a register of the army, and a list of the navy of the United States. By John Melish. Philadelphia, G. Palmer, 1813. 22 cm. (G1201.S42M4 1813 Vault; Phillips 1346)

22
Atlas of the State of South Carolina, made under the authority of the legislature; prefaced with a geographical, statistical and historical map of the State. By Robert Mills, of South Carolina, P. A. engineer and architect. Baltimore, F. Lucas, Jr. [1825] 56 cm. (G1305.M5 1825 Vault; Phillips 2570)

23
Statistics of South Carolina, including a view of its natural, civil, and military history, general and particular. By Robert Mills, of South Carolina, P. A. engineer and architect. Charleston, Hurlbut and Lloyd, 1826. 22 cm. (F269.M65 Copy 2 G&M RR)

24
A new American atlas containing maps of the several states of the North American union. Projected and drawn on a uniform scale from documents found in the public offices of the United States and state governments, and other original and authentic information, by Henry S. Tanner. Philadelphia, H. S. Tanner, 1823. 59 cm. (G1200.T3 1823d Vault; Phillips 1374)



Robert Mills. Atlas of the State of South Carolina . . . . Baltimore, 1825. (Item 22)

American Globes

25
James Wilson of Vermont, American globe-maker. (G&M Vault)

[a] [Manuscript letter from Samuel Wilson to his father, dated Albany, March 30, 181?.] 31 x 19 cm.

[b] [Manuscript letter from Cummings & Hilliard to James Wilson, dated Boston, July 22, 1817.] 25 x 20 cm.

[c] [Manuscript agreement signed by John Wilson and James Wilson, dated Bradford, March 10, 1818.] 18 x 17 cm.

[d] [Broadside] Wilson's American globes. Albany, April 1828. 32 x 20 cm.

26
A celestial globe with all the stars of the 1st, 2d & 3d magnitudes. Alb[an]y, Wilson & Sons [182-?] Col. globe 8 cm. in diameter. (G3190 182-.W5 Vault)

Mounted in full meridian set in wooden horizon on wooden stand, total height 23 cm.

27
Three inch terrestrial globe. Albany, Wilson & Co. [182-] Col. globe 8 cm. in diameter. Scale not given. (G3170 182-.W5 Vault)

Mounted in movable brass ring with wooden horizon ring. Wood stand, total height 24 cm.

28
A new American celestial globe, containing the positions of nearly 5,000 stars, clusters, nebulae, &c. carefully compil'd & laid down from the latest & most approv'd astronomical tables reduced to the present time. Albany, J. Wilson & Sons, 1831. Col. globe 33 cm. in diameter.

Mounted in full movable brass meridian circle in wooden stand with wooden horizon circle.

29
A new American thirteen inch terrestrial globe, exhibiting with the greatest possible accuracy, the positions of the principal known places of the earth; with the tracks of various circumnavigators together with new discoveries and political alterations down to the present period, 1834. Albany, J. Wilson & Sons. [1834] Col. globe 33 cm. in diameter. Scale not given. (G3170 1834.W5 Vault)

Mounted in movable full meridian circle in wooden stand with wooden horizon circle. Movable brass pointer at north pole.

Canal, Turnpike, and Railroad Maps

30
Map of the country embracing the various routes surveyed for the Balt. & Ohio rail road by order of the Board of Engineers. Drawn by Lt. J. Barney, U.S. Army. [1836?] Map 27 x 61 cm. Scale ca. 1:193,000. (G3841.P3 1836.B3)

Force map collection no. 438.

"To the Subscribers of the 'American,' from Dobbin, Murphy & Bose" is added below the title.

31
Map illustrative of a communication between the Great Lakes and Atlantic Ocean, by means of a canal from Lake Erie to Hudsons River, by John H. Eddy. [n.p.] 1816. Col. map 33 x 38 cm. Scale ca. 1:3,600,000.

32
Map of the western part of the State of New-York shewing the route of a proposed canal from Lake Erie to Hudson's River. Compiled by John H. Eddy from the best authorities. Engraved by P. Maverick, Newark, [n.p.] 1811. Col. map 29 x 53 cm. Scale 1:950,400 (15 miles to an inch).
Force map collection no. 448.

33
Mitchell's map of the United States; showing the principal travelling, turnpike and common roads; on which are given the distances in miles from one place to another: also, the courses of the canals & rail-roads throughout the country, carefully compiled from the best authorities. Philadelphia, S. Augustus Mitchell, 1836. Map printed on cloth 50 x 61 cm. Scale ca. 1:4,800,000. (G&M Vault)
"Sold by Mitchell & Hinman."

34
Map of the railroads and canals finished, unfinished and in contemplation in the United States. Drawn and engraved for D. K. Minor editor of the Railroad Journal, by William Norris, New York. [1834] Col. map 62 x 94 cm. Scale ca. 1:3,250,000. (G&M map coll.)

35
Map of the country through which a canal to connect the waters of the Chesapeake and Ohio is proposed to pass and of the national road between Cumberland and Wheeling with the adjacent country from actual survey by James Shriver. B. T. Welch & Co. Sc., Baltimore. Baltimore, F. Lucas Jr. [1824] Col. map 47 x 72 cm. Scale ca. 1:270,000. (G&M map coll.)

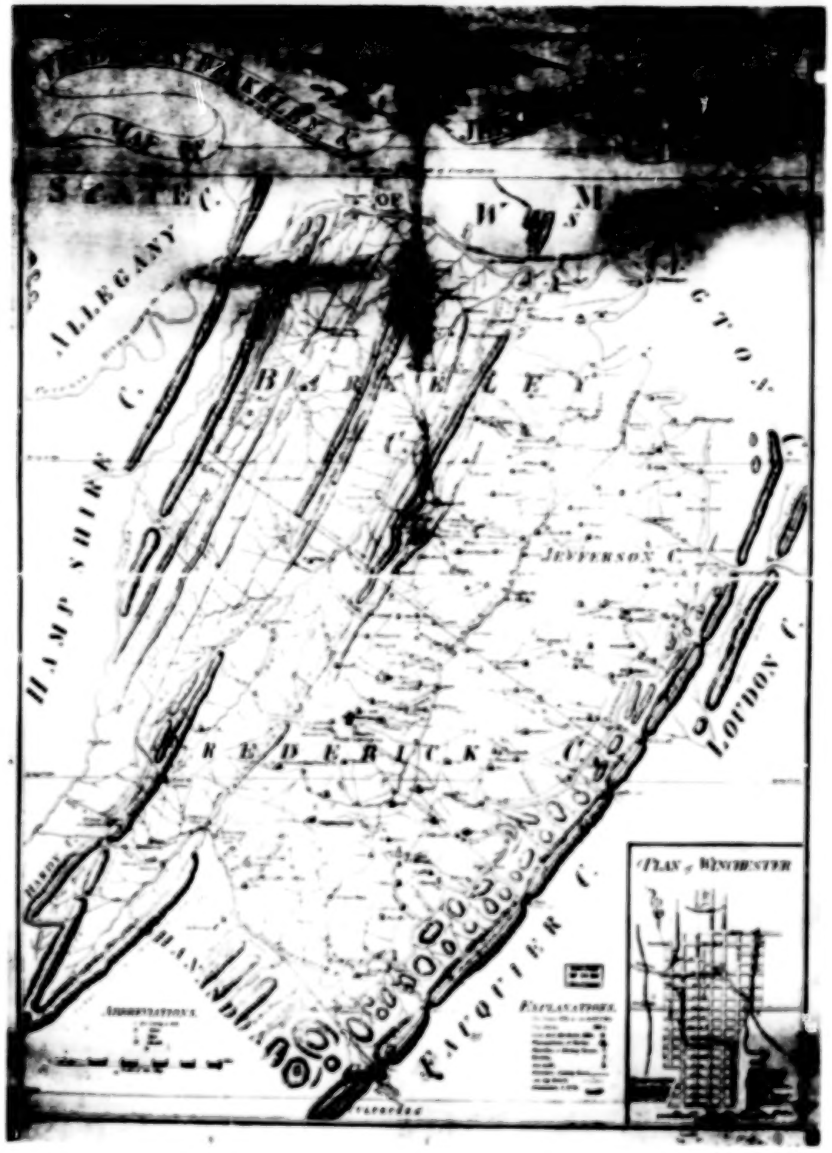
Town, County, and City Maps

36
Map of Philadelphia County. Constructed by virtue of an act of the legislature of Pennsylvania passed 19th March 1816, by John Melish. Prepared for engraving by J. Melish. Engrd. by Tanner, Vallance, Kearny & Co. Philadelphia, John Melish, 1819. Col. map 44 x 49 cm. Scale 1:79,200 (1¼ miles to an inch). (G&M map coll.)

37
To General Andrew Jackson and his brave companions in arms on the 8th of Jany. 1815, this plan of the City of New-Orleans is respectfully dedicated by Fras. B. Ogden, Jany. 8th 1829. Engraved by Peter Maverick, New York. [n.p., 1829] Col. map 67 x 107 cm. Scale not given. (G&M map coll.)

38
An index to the map of Wayne and Pike Counties, Pennsylvania. Comprising the names of the original warrantees, and quantities of the respective tracts, distinguished by numbers corresponding with those on the map. With explanatory remarks. [By Jason Torrey] Philadelphia, Joseph Rakestraw, 1814. 78 p. 21 cm. (G&M Vault)

39
A map of Wayne & Pike Counties, Pennsylvania; shewing the situations & forms of the warrantee tracts, with the numbers by which the respective tracts are designated on the maps & books in the Office of the Commissioner of Taxes for Wayne County; the townships, boundaries, roads, waters and principal places, by Jason Torrey. Entered according to Act of Congress the 7th day of April 1814, by Jason Torrey of the State of Pennsylvania. Engraved by H. S. Tanner, Philada. [Philadelphia] © 1814. Col. map 67 x 48 cm. Scale ca. 1:160,000. (G&M Vault)



Charles Varlé. Map of Frederick, Berkeley, & Jefferson Counties in the State of Virginia. Winchester, Va., 1809. (Item 40)

40
Map of Frederick, Berkeley, & Jefferson Counties in the State of Virginia. Executed A.D. 1809 by Chas. Varlé Engineer & Geographer. Engraved by Benjn. Jones, Philadelphia. [Winchester, Va., 1809] Map 85 x 62 cm. Scale ca. 1:136,000. (G&M Vault)

41
To the citizens of Philadelphia this new plan of the city and its environs is respectfully dedicated by the editor. 1802. P. C. Varlé, Geographer & Enginr. Del. Map 45 x 62 cm. Scale ca. 1:14,850. (G&M Vault)

Force map collection no. 578.

42
Warner & Hanna's plan of the city and environs of Baltimore, respectfully dedicated to the Mayor, City Council, & citizens thereof, by the proprietors, 1801. [Baltimore, Warner & Hanna, 1801] Col. map 48 x 72 cm. in covers 52 x 39 cm. Scale ca. 1:4356 (1 inch equals 22 perches). (G&M Vault)

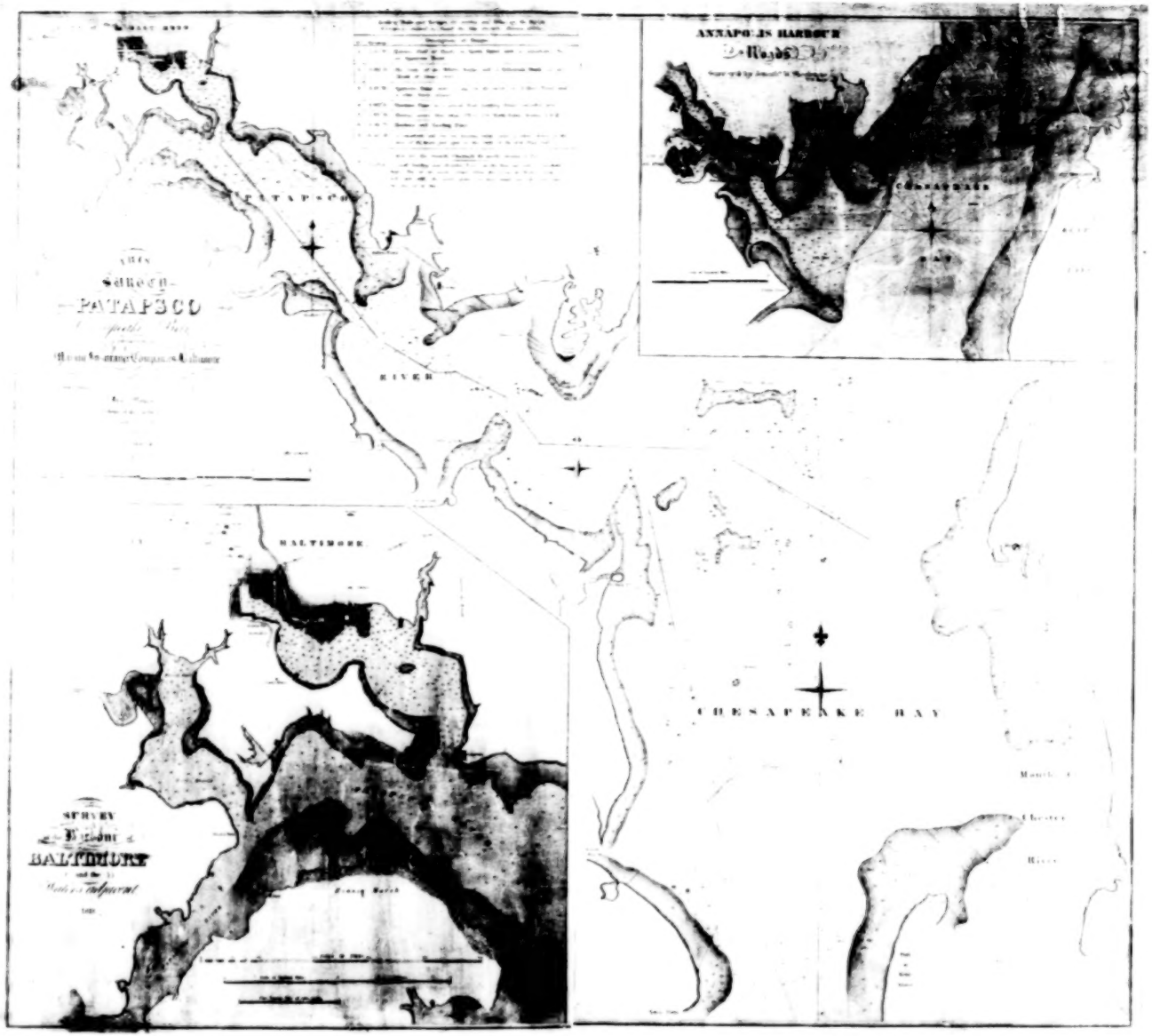
Coastal and Navigation Charts

43
The coast of the United States of North America; from New York to St. Augustine: Drawn and regulated according to the latest surveys and astronomical observations; By Edmund Blunt. New York, E. & G. W. Blunt. [© 1827] Map 64 x 95 cm.

Removed from: Blunt's charts of the North and South Atlantic Oceans, the coast of North and South America, and the West Indies. New York, E. & G. W. Blunt, 1830. 79 x 53 cm. Map no. 7?. (G1101.P5B5 1830 Vault; Phillips 3661)

Sheet on display shows from Long Island, N.Y., to Cape Hatteras, N.C.

Warner & Hanna's plan of the city and environs of Baltimore . . . . Baltimore, 1801. (Item 42)



Lewis Brantz. This survey of the River Patapsco and part of Chesapeake Bay . . . . Baltimore, 1819. (Item 44)

44
This survey of the River Patapsco and part of Chesapeake Bay instituted by the Marine Insurance Companies of Baltimore and executed at their expense, under the direction of Lewis Brantz, is respectfully dedicated by them to James Monroe, President of the United States, as a mark of the high sense they entertain of his exalted character. Cone & Freeman Sc., Baltimore. Baltimore, F. Lucas, Jr., 1819. Col. map 79 x 92 cm. Scale ca. 1:40,960. (G3842.P34 1819.B7 Vault)

45
The western navigator; containing charts of the Ohio River, in its whole extent, and of the Mississippi River, from the mouth of the Missouri to the Gulf of Mexico accompanied by directions for the navigation of the Ohio and Mississippi, and such information concerning the towns, &c. on their banks, as will be most useful to travellers. By Samuel Cumings. Vol. I. Philadelphia, E. Littell, 1822. 27 maps. 42 cm. (G1376.P5C8 1822 Vault copy 2)

46
A new chart of the coast of Connecticut, New York, New Jersey and the Delaware. Drawn from the latest authorities by Samuel Lambert. Wightman sculpsit. Salem, Massachusetts, 1815. Map 62 x 94 cm. in 2 parts, each 62 x 47 cm. Scale ca. 1:635,000. (G&M map coll.)

47
A chart of Nantucket Shoals surveyed by Capt. Paul Pinkham. Boston, John Norman, 1791. Map 51 x 78 cm. Scale ca. 1:160,000.

Removed from: John Norman. The American pilot. Boston, John Norman, 1792. 56 x 48 cm. Map no. 1. (G1106.P5N5 1792 Vault; Phillips 4474a)

48
A map of Lewis and Clark's track, across the western portion of North America from the Mississippi to the Pacific Ocean; by order of the Executive of the United States, in 1804, 5 & 6. Copied by Samuel Lewis from the original drawing of Wm. Clark. Saml. Harrison fct. [Philadelphia, 1814] Map 31 x 71 cm. Scale ca. 1:4,500,000. (G&M map coll.)

Force map collection no. 409 (copy 1).

49
A chart of the internal part of Louisiana including all the hitherto unexplored countries, lying between the River La Platte of the Missouri on the N: and the Red River on the S: the Mississippi East and the mountains of Mexico West; with a part of New Mexico & the Province of Texas, by Z. M. Pike, Captn. U.S.I. [Drawn by Anthony Nau. Philadelphia, 1810] Map 45 x 40 cm. Scale ca. 1:3,550,000. Plate II. (G&M map coll.)

From his: An account of expeditions to the sources of the Mississippi, and through the western parts of Louisiana, to the sources of the Arkansaw, Kans, La Platte, and Pierre Jaun, rivers; performed by order of the Government of the United States during the years 1805, 1806, and 1807 . . . Philadelphia, C. & A. Conrad & Co., 1810.

The Industrial Revolution and Cartography, ca. 1830–1865

Lithography and Cartography

50
Map of the military bounty lands in the State of Illinois shewing the true boundaries of each county, as fixed by the legislature in 1825. By H. Ball. Drawn on stone & printed by M. Williams. New York, 1827. Map 37 x 28 cm. Scale ca. 1:900,000. (G&M map coll.)

51
Map of Cleveland and its environs surveyed and published by Ahaz Merchant, October, 1835. N. currier's Lithy. New-York. [New York] Ahaz Merchant, 1835. Map 52 x 73 cm. Scale not given. (G&M map coll.)

52
Map of Halifax, Mass. Surveyed & drawn by S. Thompson in 1832. Boston, Pendleton's Lithography [1832] Map 46 x 49 cm. Scale 1:19,800 (100 rods to an inch). (G&M map coll.)

General Maps and Atlases

53
Colton's general atlas, containing one hundred and eighty steel plate maps and plans, on one hundred and nineteen imperial folio sheets, drawn by G. Woolworth Colton. Letter-press descriptions, geographical, statistical, and historical, by Richard Swainson Fisher. New York, G. W. & C. B. Colton & Co., 1866. 45 x 39 cm. (G1019.C55 1866; Phillips 6155)

54
Map of the United States of America, the British provinces, Mexico, the West Indies and Central America with part of New Granada and Venezuela. Map drawn by Geo. W. Colton, engraved by John M. Atwood, border desigd. & engd. by W. S. Barnard, New York. New York, J. H. Colton, 1848. Map 84 x 106 cm. in 2 parts, each 84 x 53 cm. (G3700 1848. C6.)

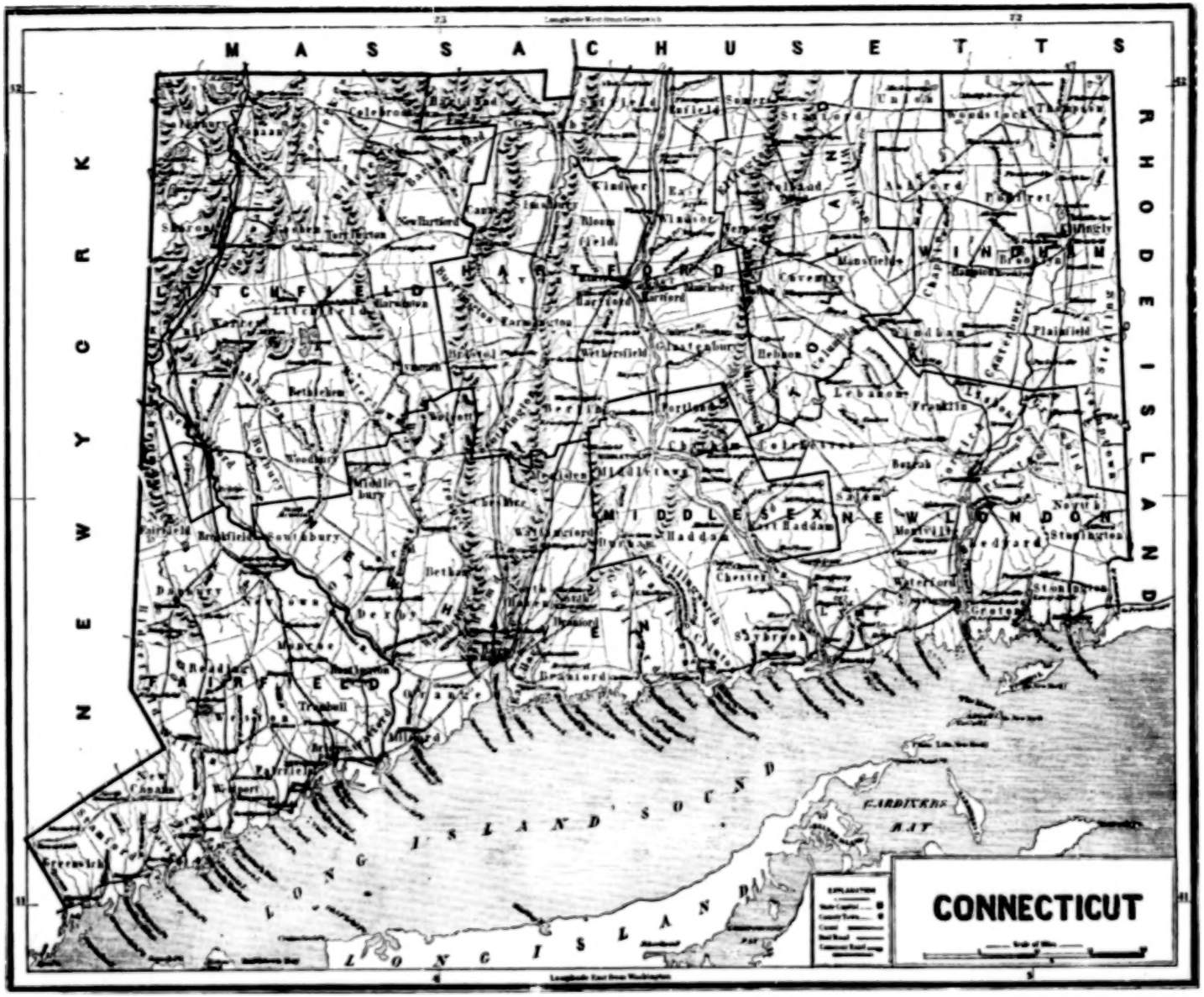
55
The Washington map of the United States, by M. F. Maury, L.L.D., Commander, U.S. Navy, Superintendent, U.S. National Observatory, Washington, D.C. Washington, H. G. Bond, 1860. Col. map 164 x 173 cm. in 2 sheets, each 82 x 173 cm. (G3700 1860 .M3)
Copyrighted by Robert P. Smith.

56
Connecticut. Philadelphia, S. Augustus Mitchell, 1846. Col. map 33 x 39 cm. Scale ca. 1:540,000. (G&M map coll.)

57
Connecticut. [New York, Sidney E. Morse and Samuel Breese, 1842?] Col. map 28 x 36 cm. Scale ca. 1:500,000. (G&M map coll.)

58
Connecticut. Philadelphia, H. S. Tanner [© 1834] Col. map 30 x 36 cm. Scale ca. 1:540,000. (G&M map coll.)

59
A new universal atlas containing maps of the various empires, kingdoms, states and republics of the world, with a special map of each of the United States, plans of cities &c . . . Philadelphia, S. Augustus Mitchell, 1846. 45 x 37 cm. (G1019.M64 1846; Phillips 6103)



Sidney E. Morse and Samuel Breese. Connecticut. New York, 1842? (Item 57)

60
The cerographic atlas of the United States. By Sidney E. Morse, A.M., and Samuel Breese, A.M. New York, Sidney E. Morse & Co., 1842-[45] 46 x 37 cm. (G1200.M66 1842 Vault; Phillips 1383)

At head of title: Supplement to the New-York Observer.

Issued in parts; maps dated 1841-1845.

With this is bound: Sidney E. Morse. The cerographic Bible atlas. New York, 1845.

61
Mitchell's traveller's guide through the United States, containing the principal cities, towns, &c. alphabetically arranged; together with the stage, steam-boat, canal, and railroad routes, with the distances, in miles, from place to place. Illustrated by an accurate map of the United States. Philadelphia, Mitchell & Hinman, 1837. 14 cm. (E158.M674 G&M map coll.)

62
Mitchell's travellers guide through the United States. A map of the roads, distances, steam boat & canal routes &c. by J. H. Young. Engraved on steel by J. H. Young & D. Haines. Philadelphia, S. Augustus Mitchell, 1837. Col. map 44 x 55 cm. Scale ca. 1:4,800,000. (G3700 1837.Y6)

63
A new map of the United States, upon which are delineated its vast works of internal communication, routes across the continent &c. showing also Canada and the island of Cuba, by W. Williams. Philadelphia, Lippincott, Grambo & Co., 1851. Col. map 73 x 85 cm. in 2 parts, each 73 x 43 cm. Scale ca. 1:4,200,000. (G3700 1851 .W5a)

Town, County, and City Maps

64
Gazetteer of the State of New York: embracing a comprehensive view of the geography, geology, and general history of the State, and a complete history and description of every county, city, town, village, and locality, with full tables of statistics, by J. H. French, LL.D. 8th ed. [Syracuse, R. P. Smith, 1860] (F117.F75 1860g G&M RR)

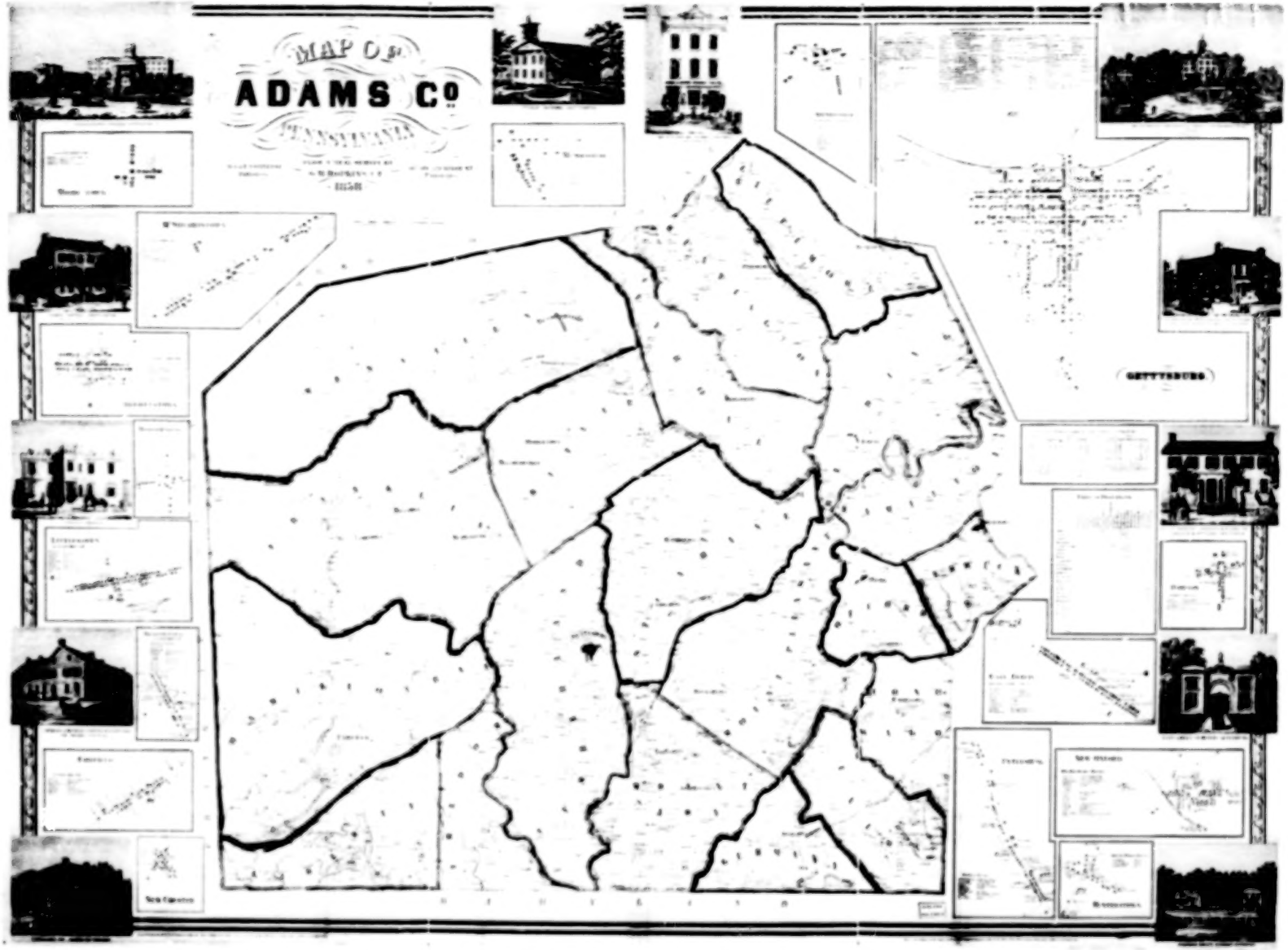
65
The State of New York from new and original surveys under the direction of J. H. French, C.E. Syracuse, Robert Pearsall Smith, 1859. Col. map 168 x 184 cm. Scale 1:300,000. (G&M map coll.)

66
Map of Adams Co., Pennsylvania, from actual surveys by G. M. Hopkins C.E. Philadelphia, M. S. & E. Converse, 1858. Col. map 93 x 135 cm. Scale 1:50, 688. (G&M map coll.)

67
Map of Geauga and Lake Counties, Ohio. From surveys & county records. Philadelphia, S. H. Matthews, 1857. Col. map 151 x 111 cm. Scale ca. 1:43,000. (G&M map coll.)

Copyrighted by Robert Pearsall Smith.

68
Plan of the City of St. Louis. Survey ordered July 10th 1823, completed in December 1823, adopted in March, 1824. Revised & corrected in June 1835. Surveyed & designed by R. Paul, City Surveyor & Commissioner. G. Kramm del. Lehman & Duval Lithrs., Philadelphia. [Philadelphia] © 1835. Col. map 48 x 82 cm. Scale 1:3600 (300 feet to an inch). (G&M map coll.)



Griffith M. Hopkins. Map of Adams Co., Pennsylvania . . . . Philadelphia, 1858. (Item 66)

69
Map of the circuit of ten miles around the city of Philadelphia with the names of villages, roads, mills, property owners, taverns, &c. From original surveys by J. C. Sidney, C. E. Delaware Co. by Dr. Ash. Drawn by J. C. Sidney. Engraved by N. Friend. Prd. at P. S. Duval's Establmnt. Philadelphia, Robert P. Smith, 1847. Col. map 55 x 54 cm. Scale 1:63,360 (1mile to an inch). (G&M map coll.)

70
Map of the Town of Concord, Middlesex County, Mass. Surveyed by authority of the Town. Boston, H. F. Walling, 1852. Col. map 62 x 78 cm. Scale ca. 1:19,200. (G&M map coll.)

Railroad and Immigrant Maps

71.
Map of the United States, the British provinces, Mexico &c. showing the routes of the U.S. mail steam packets to California, and a plan of the gold region. Drawn & engraved by J. M. Atwood, New York. Printed at Ackerman's rooms, 120 Fulton St., N.Y. New York, J. H. Colton, 1849. Col. map 47 x 62 cm. Scale ca 1:15,000,000. (G3700 1849.A72a copy 2)

72
Particulars of routes, distances, fares, &c., to accompany Colton's map of California and the gold region, collected from official documents. [New York, J. H. Colton, 1849] 11 p. 13 cm. (G3700 1849. A72 copy 3)

73
Map of the emigrant road from Independence Mo. to St. Francisco California by T. H. Jefferson. New York, 1849. Map in 4 sheets, each 38 x 52 cm., bound in covers 41 x 31 cm. Scale ca. 1:1,250,000. (G&M Vault)

74
Lloyd's American railroad map of the United States showing the three proposed roads and the overland mail route to the Pacific. 1859. [New York, James T. Lloyd, 1859] Col. map 61 x 91 cm. Scale ca. 1:6,500,000. (G&M map coll.)

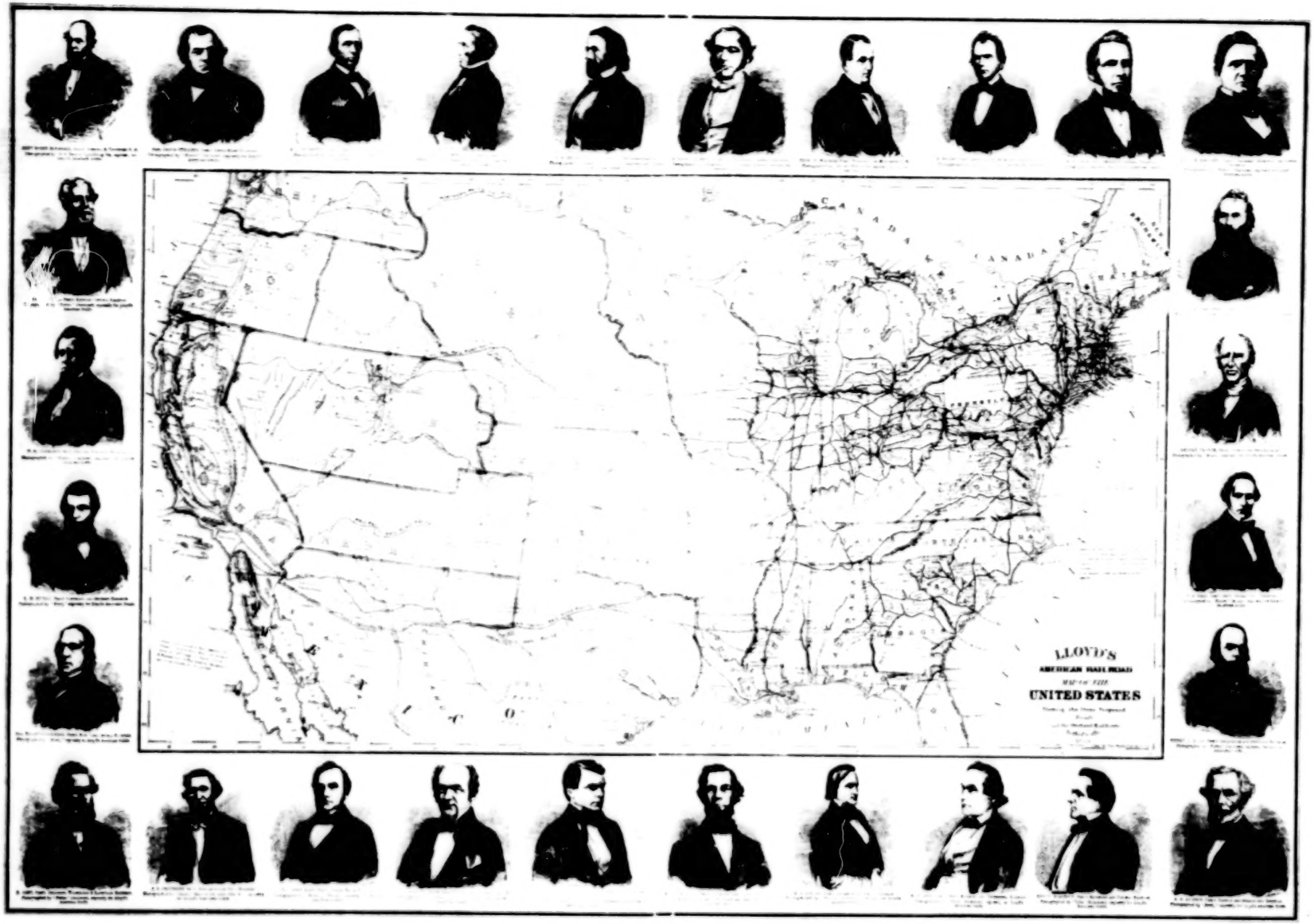
"Drawn & engraved at Rae Smith's 71 Nassau St. N.Y. From materials furnished to the 36th Congress March 1859 by G. K. Warren Lt. U.S. Top. Eng. for the passage of the Pacific Railroad Bill."

75
Guide to the Kansas gold mines at Pike's Peak, describing the routes, camping places, tools, outfits, &c. from notes of Capt. J. W. Gunnison, Topographical Engineer. Also, an address on the new gold mines, delivered at Kansas City, by Col. Wm. Gilpin of Independence, Mo. Accompanied by a map of the routes from eastern Kansas to the mines. Cincinnati, E. Mendenhall, 1859. 18 cm. (G&M map coll.)

76
Map of Kansas with route from Kansas City to the gold mines. Litho: by Middleton Strobridge & Co. Cin: O. [Cincinnati] E. Mendenhall, ©1859. Map 24 x 59 cm. Scale ca. 1:2,200,000. (G&M map coll.)

Geology and Mining Maps

77
Geological map of the middle and western states, by James Hall. Lith. of Endicott, New York. [1843] Col. map 58 x 82 cm. Scale ca. 1:1,900,800. (G&M map coll.)



James T. Lloyd. Lloyd's American railroad map of the United States . . . . New York, 1859. (Item 74)

78
Appendix to Jackson's map of the mining districts of California, bringing down all the discoveries since 1849, to the present time, of the placers and all descriptions of vein mines, to which so much attention is at this time directed. Also the new towns built and located, with the boundaries of the counties, and the seats of justice in each. Second edition, revised and enlarged. New York, Lambert & Lane, 1851. 16 p. 15 cm. (G&M map coll.)

79
Map of the mining district of California, by Wm. A. Jackson. New York, Lambert & Lane [© 1851] Col. map 59 x 50 cm. Scale ca. 1:597,000. (G&M map coll.)

80
Map of the United States of America. Designed to illustrate the geological memoir of Wm. Maclure Esqr. J. Melish del. Philadelphia, John Melish [1818] Col. map 34 x 45 cm. Scale ca. 1:6,000,000. (G&M map coll.)

Transactions American Philosophical Society vol. 1, new series, Feb. 4, 1818.

81
Reynolds's political map of the United States, designed to exhibit the comparative area of the free and slave states, and the territory open to slavery or freedom by the repeal of the Missouri Compromise. With a comparison of the principal statistics of the free and slave states, from the census of 1850. New York, Wm. C. Reynolds and J. C. Jones; Chicago, Rufus Blanchard [© 1856] Col. map 54 x 76 cm. on sheet 73 x 84 cm. (G&M map coll.)

The Civil War and Private Cartography

82
Panorama of the seat of war. Birds eye view of Virginia, Maryland, Delaware and the District of Columbia. Drawn from nature and lith. by John Bachmann. Published by J. Bachmann, N.Y. New York, A. Rumpf, © 1861. Col. perspective map on sheet 59 x 76 cm. Not drawn to scale. (G&M map coll.)

83
Scott's great snake. [Cincinnati; J. B. Elliott, © 1861] Col. map on sheet 41 x 54 cm. Scale not given. (G&M map coll.)

Cartoon map illustrating Gen. Winfield Scott's plan to crush the Confederacy economically.

84
Lloyd's new military map of the border & southern states. Drawn by Edward S. Hall. Waters & son, engravers. New York, H. H. Lloyd & Co., 1862. Col. map 78 x 105 cm. Scale ca. 1:1,850,000. (G&M map coll.)

Post-Civil War Map Production
ca. 1865–1900

General Maps and Atlases

85
Relief map of South America. Manufactured and published by Atlas School Supply Co. Patented May 3rd 1892, Jan. 15th 1895, Apr. 9th 1895. Chicago, © 1907. Col. map 101 x 70 cm. in wooden frame 121 x 87 cm. Scale 1:7,500,000; vertical scale 20:1 or 6 miles to 1 inch. (G5201.C18 1907.A8 Model)

Papier-mâché relief model mounted in wooden frame.

86
Bridgman's embellished official railway, distance and county map of the United States from the latest official and authentic sources. New York and Cincinnati, E. C. Bridgman [1800, © 1879] Col. map 99 x 146 cm. Scale ca. 1:3,168,000 (50 miles to 1 inch). (G3700 1880.B7)

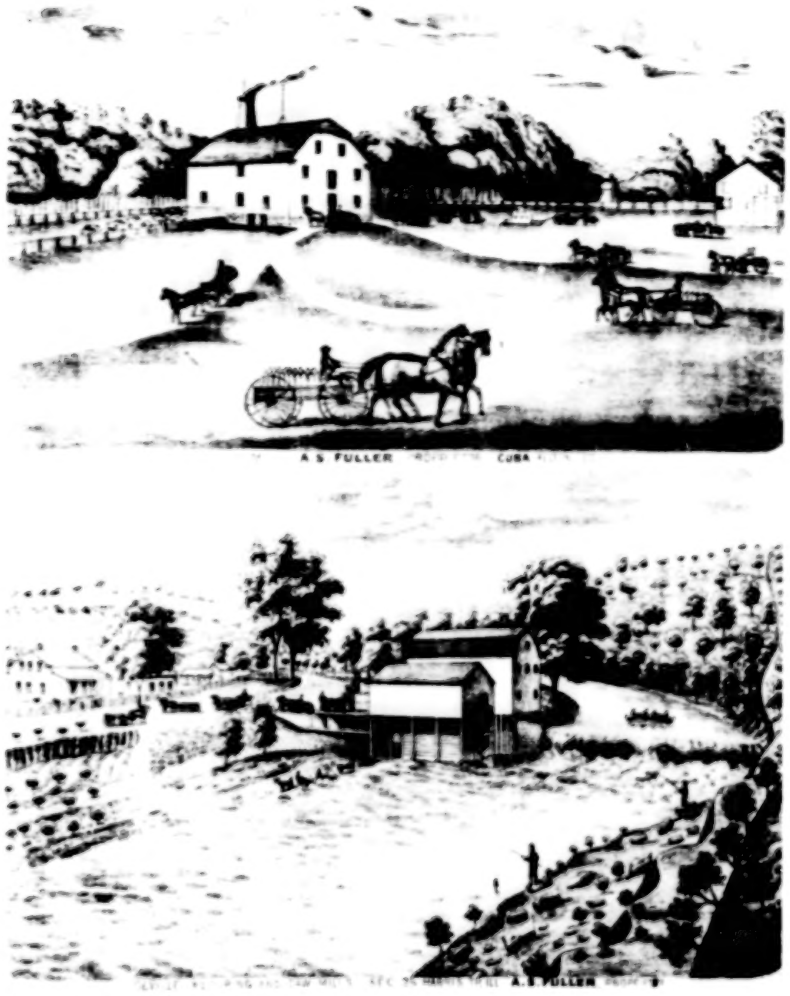
87
Galbraith's railway service maps. Nebraska. Chicago, McEwen Map Co. [© 1897, © 1898] Col. map 137 x 199 cm in 4 parts, each 68 x 100 cm. Scale not given. (G&M Vault)
Manuscript map with printed title and list of counties.

88
The American union railroad map of the United States, British possessions, West Indies, Mexico, and Central America. Smith & McDougal, Electrotypers, New York. New York, Haasis & Lubrecht, 1872. Col. map 94 x 139 cm. Scale ca. 1:4,500,000. (G&M map coll.)

89
Map of the United States of America. Karta öfver Förenta Staterna af Nord-Amerika. Karte der Vereinigten Staaten von Nord-Amerika. New York, G. W. & C. B. Colton & Co. [© 1871] Col. map 41 x 82 cm. (G3700 1871. C62 copy 2)

90
Mitchell's school atlas: comprising the maps and tables designed to accompany Mitchell's school and family geography. Philadelphia, E. H. Butler & Co., 1866. 31 cm. (G1019.M66 1866) 2 copies.
Cover title: Mitchell's school atlas. Revised edition.

Frank H. Galbraith. Galbraith's railway service maps. Nebraska (detail). Manuscript map, © 1897, 1898. (Item 87)



Andreas, Lyter, and Company. Atlas map of Fulton County, Illinois. Davenport, Iowa, 1871. (Item 92)

91
The telegraphic globe, compiled from the best authorities, with telegraph lines drawn by Prof. Morse, expressly for this globe. New York, Silicate Book Slate Company, © 1872. Col. globe 31 cm. in diameter. Scale not given. (G3170 1872.S51 Vault copy 2)

Mounted in full movable brass meridian ring in wooden stand, with wooden horizon ring with months and signs of zodiac.

County Maps and Atlases

92
Atlas map of Fulton County, Illinois. Compiled, drawn, and published from personal examinations and surveys, by Andreas, Lyter, & Co. Davenport, Iowa, 1871. 44 x 37 cm. (G1408.F8.A55 1871)

93
Bridgens' atlas of Lancaster Co., Penna. From actual surveys by H. F. Bridgens and assistant. Lancaster, Pa., D. S. Bare, 1864. 42 x 42 cm. (G1263.L3B7 1864)

State Atlases

94
An illustrated historical atlas of the State of Minnesota. Chicago, A. T. Andreas, 1874. 46 cm. (G1425.A3 1874; Phillips 2007)

95
Atlas of the state of Ohio, from surveys under the direction of H. F. Walling. New York, Henry S. Stebbins, 1868. 43 cm. (G1395.W3 1868)

Real Estate and Insurance Maps and Atlases

96
Map of Salt Lake City and suburbs. Salt Lake City, John L. Burns, 1871. Col. map 69 x 86 cm. Scale 1:15,840 (4 inches to one mile). (G&M map coll.)

97
A complete set of surveys and plats of properties in the City of Washington, District of Columbia. Compiled and drawn from official records and actual surveys. Philadelphia, G. M. Hopkins, 1887. 58 x 43 cm. (G1275.H6 1887; Phillips 1503)

98
Insurance map of Toledo, Ohio 1868. [New York, D. A. Sanborn & Co., 1868] Col. map in 6 sheets, each 65 x 54 cm. (G&M Vault)

Panoramic Maps of American Cities

99
El Reno, Oklahoma Territory, 1891. Drawn by T. M. Fowler, Morrisville, Pa. Published by T. M. Fowler and James B. Moyer. [1891] Manuscript map 33 x 53 cm. Perspective map not drawn to scale (G4024.E5A3 1891.F6 Vault)

100
Cripple Creek, 1896. Phillips & Desjardins. Copyrighted 1896. Denver, Western Litho. Co., © 1896. Col. map 70 x 93 cm. Perspective map not drawn to scale. (G4314.C9A3 1896.P5)

Alfred T. Andreas. An illustrated historical atlas of the State of Minnesota. Chicago, 1874. (Item 94)

Albert Ruger. Bird's eye view of the city of Hannibal, Marion Co., Missouri, 1869. (Item 1011)

101 Bird's eye view of the city of Hannibal, Marion Co., Missouri. 1869. Drawn by A. Ruger. [n.p., 1869] Col. map 56 x 66 cm. Perspective map not drawn to scale. (G4164.H2A3 1869.R8 Rug 127)

Ruger map collection, no. 127.

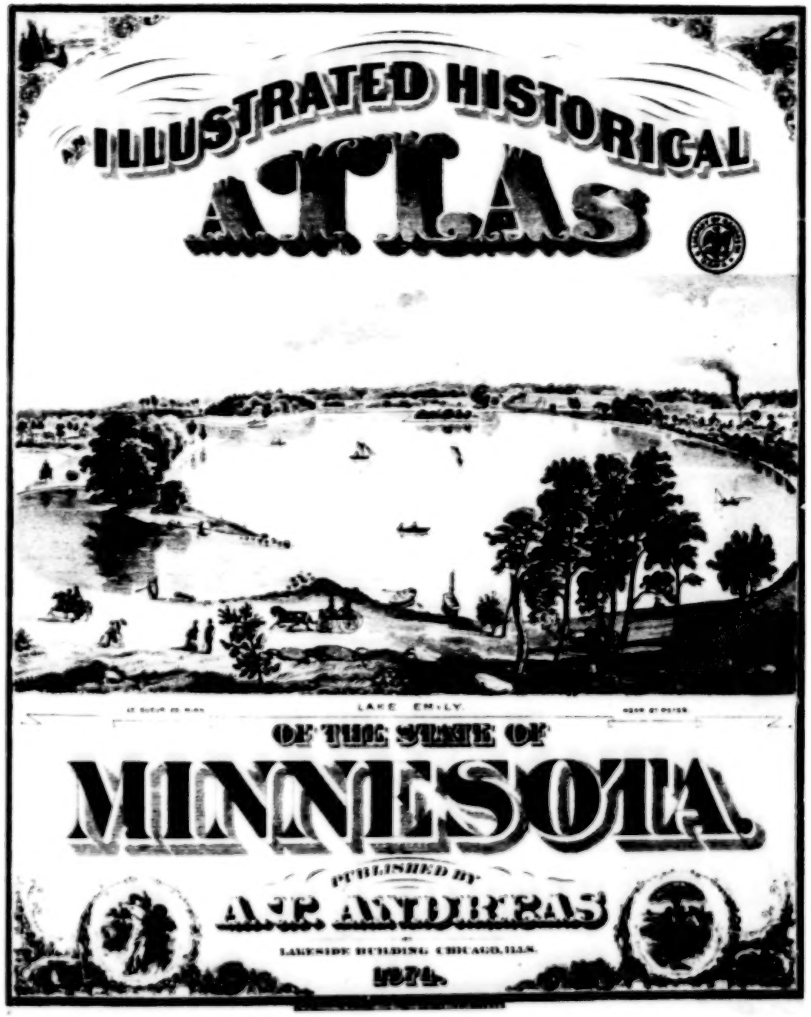
Thematic Maps

102
Telegraph stations in the United States, the Canadas & Nova Scotia. Compiled from reliable sources by Chas. B. Barr, Pittsburgh, Pa. Pittsburgh, Wegner & Buechner lith., © 1853. Col. map 59 x 85 cm. Scale ca. 1:4,200,000. (G&M map coll.)

103
How the public domain has been squandered. Map showing the 139,403,026 acres of the people's land—equal to 871,268 farms of 160 acres each worth at $2 an acre, $278,806,052, given by Republican Congresses to railroad corporations. This is more land than is contained in New York, New Jersey, Pennsylvania, Ohio, and Indiana. Rand, McNally & Co., Engr's, Chicago. [n.p.] Democratic Platform, 1884. Map 30 x 40 cm. on sheet 56 x 42 cm. Scale ca. 1:11,400,000. (G&M map coll.)

Propaganda map indicating the extent of land grants to railroads and wagon roads.

104
Denison's annual climatic map of the United States. Graphically illustrating cloudiness, with isotherms, precipitation lines, winds (arrows), and annual tables. Compiled from data of the Signal Service Bureau by Charles Denison, A.M., M.D., Professor of Diseases of the Chest and of Climatology, University of Denver. Rand, McNally & Co., Engr's, Chicago. [n.p.] © 1884. Col. map 41 x 64 cm. on sheet 66 x 68 cm. Scale ca. 1:7,500,000. (G&M map coll.)



Democratic Platform. How the public domain has been squandered. 1884. (Item 103)

105
The presidential elections of the United States. Designed & drawn by Henry Clay Donnell, San Francisco, Cal. Lith. Britton & Rey, San Francisco, Cal. [n.p.] U.S. Election Map Co., © 1877. 23 col. maps each 14 x 27 cm. on sheet 91 x 113 cm. (G&M map coll.)

106
Metallic circuit lines of the American Telephone and Telegraph Company. January 1895. Compiled & drawn by John Hart, Jersey City, N.J. New York, J. Ottmann Lith. Co., 1895. Col. map 75 x 111 cm. Scale not given. (G&M map coll.)

107
Rand, McNally & Co.'s map of the United States showing, in six degrees, the density of population, 1890. Chicago, Rand, McNally & Co., © 1892. Col. map 33 x 51 cm. Scale ca. 1:10,000,000. (G3700.E2 1890.R31 copy 2)

108
Historical geography. Orcutt Lithographing Co., Chicago. [n.p.] John F. Smith, © 1888. Col. map 54 x 85 cm. Scale ca. 1:6,800,000. (G&M map coll.)

Allegorical map depicting the evils derived from slavery.

109
The Van Ness route and shipping guide for the shoe and leather trades of the United States. R. D. Servoss, Eng'r, N.Y. [Boston, Joseph Van Ness, © 1893] Col. map 69 x 95 cm. on sheet 103 x 128 cm. in 2 parts, each 103 x 64 cm. Scale ca. 1:3,738,240. (G&M map coll.)

Wax Engraving

110
Rand, McNally & Co.'s business atlas containing large scale maps of each state and territory of the great Mississippi valley and Pacific slope . . . Chicago, Rand, McNally & Co., 1876–77. 36 x 28 cm. (G1200.R32 1876 Vault; Phillips 1397)

111
Rand, McNally & Company's standard map of the United States of America, with portions of the Dominion of Canada and the Republic of Mexico. Chicago, Rand, McNally & Co., 1887, © 1886. Col. map 269 x 424 cm. in 9 parts. Scale 1:1,150,000. (G&M map coll.)

Bicycle Maps and Guides

112
Map of the New England States, showing state, county & town boundaries, post offices, railroad stations &c. Boston, Geo H. Walker & Co., © 1894. Col. map 103 x 71 cm. Scale ca. 1:760,000. (G3720 1894.W32 copy 2)

Bicycling routes are depicted by red lines.

END

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